March 19, 1956

"Hunting License" for Railroads . . . p.70

RAILWAY AGE

WORKBOOK OF THE RAILWAYS

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Workbook of the Railways

Vol. 140, No. 12
March 19, 1956

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. . . Class I railroads in January had estimated net income, after interest and rentals, of $46,000,000, compared with $52,000,000 in the same 1955 month. January net railway operating income, before interest and rentals, was $62,877,376 also about $6,000,000 below January 1955. . . . p.7

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HOW DOME CARS ACT IN CURVES . . .

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RAILROADS—HERE'S YOUR HUNTING LICENSE . . .

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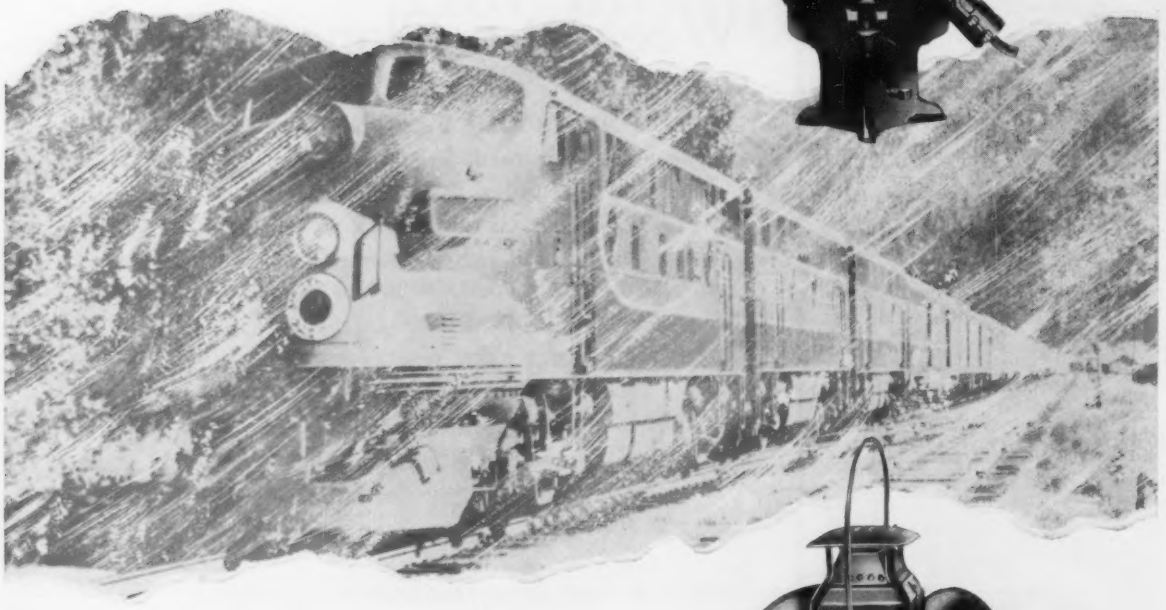
. . . This theme characterized outstanding discussions at

in any weather



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Current Statistics

Operating revenues, twelve months	
1955	$10,106,398,133
1954	9,370,825,498
Operating expenses, twelve months	
1955	$ 7,646,291,405
1954	7,384,499,680
Taxes, twelve months	
1955	$ 1,080,504,965
1954	861,281,657
Net railway operating income, twelve months	
1955	$ 1,128,115,275
1954	874,017,894
Net income, estimated, twelve months	
1955	$ 917,000,000
1954	677,000,000
Average price 20 railroad stocks	
March 13, 1956	103.33
March 15, 1955	88.26
Carloadings revenue freight	
Nine weeks, 1956	6,174,423
Nine weeks, 1955	5,714,114
Average daily freight car surplus	
Wk. ended Mar. 10, 1956	3,593
Wk. ended Mar. 12, 1955	43,104
Average daily freight car shortage	
Wk. ended Mar. 10, 1956	4,720
Wk. ended Mar. 12, 1955	1,399
Freight cars on order	
February 1, 1956	144,946
February 1, 1955	18,395
Freight cars delivered	
One month, 1956	4,199
One month, 1955	2,008
Average number of railroad employees	
Mid-January 1956	1,047,561
Mid-January 1955	1,009,402

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the annual meeting last week of the American Railway Engineering Association. . . . p.72

COMING—NEXT WEEK . . .

. . . Second article in the Railway Age series: The better supervisors get promoted.

BRIEFS

EXIT I-G-N, ET AL . . .

. . . As soon as equipment can be relettered, long-familiar initials of several Missouri Pacific subsidiaries will disappear from the country's tracks and terminals. Cars formerly marked IGN, NOTM and StLBM henceforth will bear the MP designation.

ICC WILL EXAMINE NH STOCK BUYING . . .

. . . Formal investigation will be instituted by the ICC into agreements whereby the New Haven has undertaken to repurchase some of its securities. The agreements involve NH's commitment to purchase, from Union Securities Corporation, a block of its own preferred stock which Union acquired from the Dumaine-controlled Amoskeag Company. NH accounting practices will also be under ICC scrutiny.

NEW BRIDGE CLEARANCE LAW? . . .

. . . Legislation designed to end "undue emphasis" on water transportation, and treat all forms of surface transport as coordinate activities, is being drafted by the Department of Commerce in cooperation with other interested agencies. The idea came out of a study which pointed up the fact that some movable span railroad and highway bridges have never been opened to accommodate the watercraft which were intended to be served.

TRANSPORTATION ADVERTISING IN NEWSPAPERS . . .

. . . Continued its upward trend last year, showing a lineage increase of 17.4% over 1954. Increase of railroad advertising in newspapers was 22.3%, from 7,941,062 lines to 9,713,716 lines. Air line advertising went up 22.8%, from 18,199,188 lines to 22,348,767 lines. Bus line advertising declined 2.3%, from 4,094,248 lines to 3,999,651 lines.

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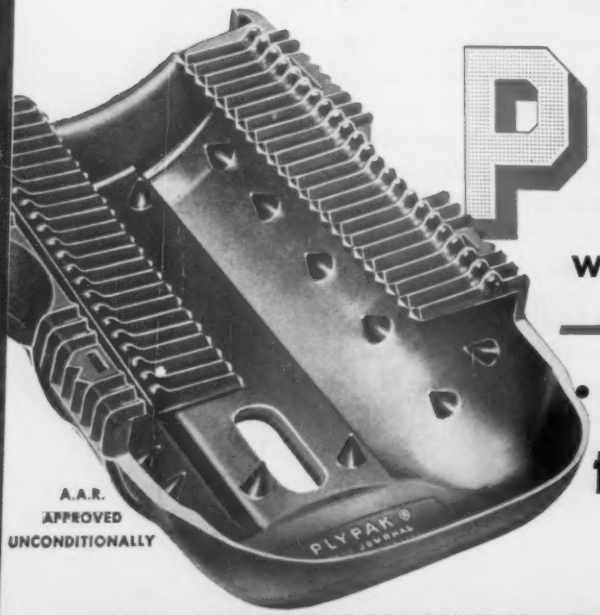

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January's Net Down $6 Million

Estimated at $46 million, compared with $52 million in January 1955—Net railway operating income, at $63 million, was also off $6 million

Class I railroads in January had an estimated net income, after interest and rentals, of $46,000,000, compared with $52,000,000 for January 1955.

The estimate was made by the AAR's Bureau of Railway Economics, which also reported that January net railway operating income, before interest and rentals, was $62,877,376—also down about $6,000,000 from January 1955's $68,889,131.

Twenty Class I roads failed to earn interest and rentals in January. The rate of return for the 12 months ended with January averaged 4.2%, compared with the 3.42% rate of return for the 12 months ended with January 1955.

CLASS I RAILROADS—UNITED STATES

Month of January	1956	1955
Total operating revenues	$831,622,598	$752,487,353
Total operating expenses	661,410,900	589,237,148
Operating ratio—percent	79.53	78.31
Taxes	85,254,760	74,617,307
Net railway operating income (Earnings before charges)	62,877,376	68,899,131
Net income, after charges (estimated)	46,000,000	52,000,000

Tuohy Sees Record C&O Net for 1956

Road is already "well on its way to surpassing 1955" as its best year, he says; carloadings of coal so far are 25% ahead of 1955; merchandise loadings up about 12½%

The Chesapeake & Ohio is well on its way to surpassing 1955 as the best year in its history, President Walter J. Tuohy told a recent luncheon meeting of the New York Society of Security Analysts.

Remote Control

Recent installation of dispatcher remote control of eight wayside radio stations on the Detroit, Toledo & Ironton, permits dispatcher to make radio calls directly to trains. He raises the station selector key, as in photograph, steps on footswitch and speaks into microphone. Call goes via line wire to wayside radio station, then via radio to the train. When call is ended, station selector key is depressed to cut radio station off the line.

Mr. Tuohy noted that C&O carloadings of coal so far this year are running 25% ahead of last year and that merchandise loadings are up about 12½%. "We estimate net income for the first quarter this year will be about $1.90 per common share, compared with $1.45 in the same quarter last year. C&O is on its way, we believe, to a net income this year well above last year's all-time record $58 million, which was $7.25 a share."

"Our railroad was for many years considered solely a 'coal railroad,'" he told the analysts. "A decade ago it embarked on a program of traffic diversification. It is a striking fact that if it had received no other revenues in 1955—that is, no coal or passenger revenues—compared with the total revenues of the 131 Class I railroads of the country, C&O still would have ranked eighteenth in size."

C&O now has on order locomotives and freight cars costing $140 million, Mr. Tuohy said, and half will be received this year. Around $20 million has been scheduled in roadway projects, which means a total of $90 million will be spent on enlargements and improvements in 1956, he added. The 222 diesel locomotives C&O has on order will bring total ownership to 1,018 units, which, at the current level of business, will be 100% dieselization, he pointed out.

Average rate of return on C&O's diesel investment is about 28%, so without the diesels 1955 cost of operation would have been $25 million greater, Mr. Tuohy emphasized.

Mr. Tuohy also said "we have the lowest ratio of bad-order cars among major railroads, staying ready to get the business and saving money by repairing cars in good times and bad. As a result of its planned track and rolling stock repairs, there is no deferred maintenance on C&O."

Research Developments—The C&O president reported the railroad is spending about $2 million annually in research. He said a self-propelled "tie-puller" machine, invented by C&O division engineer R. H. Abbott, which extracts worn ties and replaces new ones without disturbing the surrounding roadbed, is "a development with great possibilities." C&O is also testing its "Railvan" development, a merchandise carrier that can run on both rails and highway, "which we think may have the advantages of piggybacking at less cost." (Railway Age, Feb. 27, p. 8).

The bull market in coal, Mr. Tuohy said, is added evidence that 1956 will be a big year for C&O, which originates and hauls more coal than any other railroad. One-eighth of the nation's coal production comes from mines on C&O, and this year national bituminous production can be 500 million tons, up from the 465 million tons of 1955, he said.

Overseas export coal from the U.S. totaled 34 million tons last year, and all but two million tons of it passed through Hampton Roads ports. "Roughly half of it, 15 million tons, was handled over C&O's Newport News piers," Mr. Tuohy said, adding that "the likelihood of a 20% increase in total export this year, to 40 million tons, is getting wide acceptance."

Mr. Tuohy told the financial analysts that never in his 33 years in the coal business and fields related to it, had the immediate and long-range outlook for the bituminous coal industry been so good as it is today.

Stanford Offers Transport Courses

The Graduate School of Business, Stanford University, is offering a four-week program of courses—from June 24 to July 21—for management people in the transportation business (rail, highway, air, ocean), and "to provide certain values for middle-management executives which individual company programs ordinarily cannot offer."

The program includes five courses, talks by leading speakers from the transportation industry, and "presentations on general management subjects by experts in the field." Case problems from business will comprise the major part of the course material. Speakers from the "outside" include: Donald J. Russell, Southern Pacific president; Sir William Hildred, director general, International Air Transport Association; Lawrence T. Mayer, vice-president, Robert Heller & Associates; Philip H. Small, vice-president, Pacific Intermountain Express; and Profressor George P. Baker of the Harvard Business School, who is also president of the Transportation Association of America.

Courses to be offered include: Carrier Management Problems (principally "hard to decide" cases from actual experience); Business Policy; Human Relations and Administration; Appraisal of Management Techniques; and Business Economics.

The teaching staff will be drawn from the regular faculty of the Stanford Graduate School of Business—who, in addition to serving as discussion leaders, will give talks on such topics as "The Developing Role of the Comptroller," "How a User Buys Transportation," and "Effective Sales Management."

Director of the Transport Management Program is Gayton E. Germane, associate professor of transportation—who may be addressed at the School of Business, Stanford University, Stanford, Cal. Fee for the course will be $1,000 (including tuition, room and board, books, etc.) Applications must be received by April 20. There are no rigid qualifications for admission, but companies are requested to "nominate men who now hold significant junior positions and who by performance and potential are considered candidates for continued advancement."

"Seeing the Trip from a Locomotive Cab"

Experimental closed-circuit television installation by International Telephone & Telegraph Corp. offers passengers on the Rock Island's new "Jet Rocket" an opportunity to "see" the trip as though they were in the locomotive cab. (Railway Age, Feb. 6, p. 8.) The "Jet Rocket" is equipped with alternating current, eliminating need for an independent power source. Smaller console on the TV receiver is a conventional radio.

C&NW-Soo Line Studying Service to New Airport

The Chicago & North Western and the Soo Line are studying the feasibility of offering frequent rail passenger service between downtown Chicago and the O'Hare International Airport. The airport is scheduled to become Chicago's principal air terminal.

SP Replacing Roadway Signs With Reflectorized Units

Enthusiasm for reflectorized signs is picking up momentum. The Southern Pacific plans to replace all its existing roadway signs with new aluminum reflectorized units, which the SP believes will do a better job at less cost.

Each sign—now being manufactured in the road's West Oakland, Cal., mill—consists of pre-cut aluminum sheets, thin strips of reflectorized background material, and non-reflectorized black letters. The materials are pressed together, then bonded to each other by steam heat.

RAILWAY MARKET OUTLOOK THIS WEEK

a RAILWAY AGE Workbook Page

Carloadings Down.—Loadings of revenue freight in the week ended March 10 totaled 697,601 cars, the Association of American Railroads announced on March 15. This was a decrease of 13,395 cars, or 1.9%, compared with the previous week; an increase of 35,318 cars, or 5.3%, compared with the corresponding week last year; and an increase of 87,664 cars, or 14.4%, compared with the equivalent 1954 week.

Loadings of revenue freight for the week ended March 3 totaled 710,996 cars; the summary, compiled by the Car Service Division, AAR, follows:

REVENUE FREIGHT CAR LOADINGS
For the week ended Saturday, March 3

District	1956	1955	1954
Eastern	121,936	113,288	103,902
Allegheny	145,356	125,336	111,480
Pocahontas	60,961	45,955	37,219
Southern	131,727	125,640	115,043
Northwestern	75,527	71,734	67,638
Central Western	117,433	113,701	102,498
Southwestern	58,056	57,921	52,796
Total Western Districts	251,016	243,356	222,932
Total All Roads	710,996	653,575	590,576
Commodities:			
Grain and grain products	46,350	43,441	40,976
Livestock	7,208	6,668	7,154
Coal	135,677	108,339	90,829
Coke	13,388	10,194	8,538
Forest Products	45,412	42,272	38,673
Ore	20,742	15,672	14,296
Merchandise l.c.l.	64,132	64,679	64,377
Miscellaneous	378,087	362,310	325,737
March 3	710,996	653,575	590,576
February 25	687,018	631,072	595,031
February 18	698,319	650,248	618,623
February 11	684,328	638,788	623,706
February 4	680,989	635,799	624,385
Cumulative total, 9 weeks	6,174,423	5,714,114	5,541,827

In Canada.—Carloadings for the eight-day period ended February 29 totaled 91,018 cars, compared with 76,388 cars for the previous seven-day period, according to the Dominion Bureau of Statistics.

	Revenue Cars Loaded	Total Cars Rec'd from Connections
Totals for Canada:		
February 29, 1956	91,018	40,192
February 28, 1955	67,571	32,217
Cumulative Totals:		
February 29, 1956	640,946	293,608
February 28, 1955	553,738	257,058

Lightweight Trains

► *"Train X" Previewed.*—Pullman-Standard held a "previewing" of all-aluminum "Train X" at its Chicago plant last week; two such trains are being built, one for New York Central, another for New Haven; NYC's train is to be delivered in late April, NH's later this year; NYC train, to be called "Xplorer," will operate between Cincinnati and Cleveland on a schedule of about five hours.

New Equipment

FREIGHT CARS

► *Bad Order Backlog Cut.*—Class I roads had 54,292 fewer cars awaiting repairs February 1 than on same date last year, the AAR reports; total ownership and car repair ratio also declined between those dates; report is summarized below:

	Feb. 1, 1956	Feb. 1, 1955	Change
Ownership*	1,695,800	1,733,046	37,246(d)
Waiting Repairs	75,614	120,906	54,292(d)
Repair Ratio	4.5%	7.0%	2.5%(d)

*Excludes railroad-owned private refrigerator cars.

► *Florida East Coast.*—Authorized by court to purchase 100 gondola cars, Magor, and 35 covered hopper cars, Pullman-Standard, at respective costs of $715,000 and $295,225; covered hopper cars will be delivered next July, gondola cars during third quarter.

► *Norfolk & Western.*—Ordered 50 70-ton covered hopper cars, Pullman-Standard; delivery scheduled for next December.

► *Rock Island.*—Ordered 500 freight cars, Pullman-Standard; included are 300 hopper cars, 200 gondola cars.

LOCOMOTIVES

► *Steam Ownership Down to 5,759.*—Steam locomotives owned or leased by Class I roads February 1 totaled only 5,759, a drop of 2,490 from February 1, 1955, the AAR reports; diesel ownership rose, electric units declined between the same dates; report is summarized below:

	Owned or Leased		Stored Serviceable		Waiting Repairs	
	1956	1955	1956	1955	1956	1955
Diesel (units)	25,054	23,876	26	76	1,006	927
Steam (locomotives)	5,759	8,249	841	2,439	1,074	1,290
Electric (units)	632	654	13	16	81	77

► *Seaboard Air Line.*—Ordered 25 1,750-hp diesel-electric road-switching units, Electro-Motive; approximate cost $4,000,000; delivery expected to be completed by next November.

New Facilities

► *Southern Pacific.*—Awarded $45,000,000 contract to Morrison-Knudsen Company for 13-mi fill across Great Salt Lake, Utah; embankment will replace wooden trestle which has carried trains across lake since 1904; total cost of project, including engineering, will be about $49,000,000; completion scheduled for early 1960.

Grievance-Strike Injunctions Upheld

A U.S. Court of Appeals decision has upheld the Chicago River & Indiana and other roads in a dispute with the Brotherhood of Railroad Trainmen as to whether the union could rightfully strike to settle grievances, rather than have them reviewed by the National Railroad Adjustment Board.

The roads had been denied an injunction against a threatened strike by a U.S. District Court in Illinois, but appealed the judgment charging that the strike, if called, would halt movement of all trains at the Chicago stockyards. In remanding the case to the district level, the appeals court said, "the Railway Labor Act . . . authorizes . . . injunctions to prevent strikes over minor disputes" and effectively repeals sections of the Norris-LaGuardia Act [cited by the Trainmen] which might be said to apply to such railway labor disputes. The case involved pay and reinstatement claims.

Clarke Hits Weeks Report "Fallacy"

"Basic fallacy" of the Cabinet Report, Interstate Commerce Commissioner Owen Clarke said last week, "in general and with respect to its recommendations as to rates in particular, lies in a confusion of free enterprise and dynamic competition with competitive rate making."

Addressing the Delta Nu Alpha fraternity at Lancaster, Pa., he said, "competitive rate making, or what more appropriately might be called selective rate making, frequently may stifle rather than encourage free enterprise and dynamic competition."

This is so, he stated, because "competitive rate making by nature is discriminatory," and if a carrier is allowed to set rates solely on the basis of competition "it is inevitable, human nature being what it is, that competitively made rates will favor the large shipper, the large producing and consuming communities and the commodities moving in heavy volume against the small shipper, the small community and the commodity which moves in small volume."

Agrees in Principle.—Asserting that he "would like to put the record straight" with regard to the ICC's position on the Cabinet Report, he said the commission "agrees in principle" with eight of the 11 major revisions of the Interstate Commerce Act proposed in the report.

Moreover, the commissioner said, the ICC feels the Cabinet Committee might well have included measures "clearly needed" to improve the position of common carriers, including repeal of federal transportation taxes and adequate control of trip-leasing.

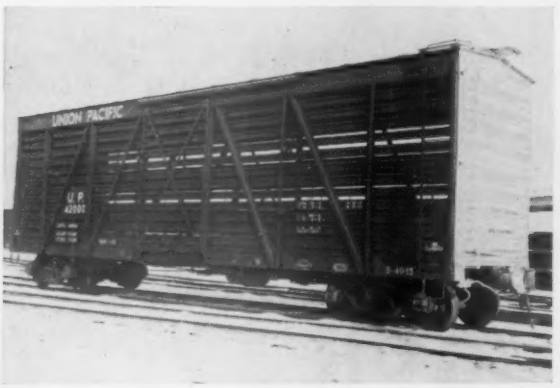
Mr. Clarke called it a "misconception" of the committee to have concluded that regulation has "continued to be based on the historic assumption that transportation is monopolistic."

He said "we do not quarrel" with giving greater play to competitive forces, but warned against "too great a removal of restraints." Mr. Clarke emphasized that "the indicated objectives of the Advisory Committee may be effectuated within the framework of present statutes, whereas the dominant effect of the proposed legislation would be to permit all rates to gravitate to the bare compensatory level."

He questioned the "prudence" of proposals to limit ICC power to set only minimum and maximum rates, disagreed with suggestions that would require a protesting carrier to bear the burden of proof in challenging a tariff, and declared that elimination of the "long-and-short haul clause" would result in an "overwhelming" tendency for "discriminatory rate making under the guise of meeting competition."

Examiner Favors Mixing Exempt, Regulated Goods

An ICC examiner has recommended that the commission should exempt the Pan-Atlantic Steamship



Union Pacific Building 300 All-Steel Stock Cars with Rubberized Slats

Construction of 300 all-purpose stock cars is underway in the Omaha shops of the Union Pacific, with delivery scheduled to be completed within two months. The cars were ordered early last year but the steel shortage has held up their completion (Railway Age, Mar. 29, 1955 p. 7). They feature steel slats treated with special insulation material (similar to under-coating of an automobile), which is a non-conductor of heat, cold, and electricity. UP believes the new all-steel cars will be easier to maintain because there will be no broken wooden slats to replace. Cattle en route to market in the new cars will get a cushioned ride. The insulation material has been tested in 25 stock cars for the past three years, and the UP has found it offers greater protection for livestock. A layer of the insulation, 3/16ths to 1/4-in. thick, is sprayed on the slats to prevent hides from sticking to car sides.

lines from regulation under Part III of the Interstate Commerce Act in hauling oil and oil products from Gulf ports to the east coast.

Rejecting protests from railroads and Seatrain Lines, Inc., W. T. Cantrell said the ICC should permit Pan-Atlantic to haul the oil in bulk as an exempt carrier in the same vessels in which it transports loaded truck trailers as a common carrier. Pan-Atlantic recently adapted two oil tankers to permit loading truck trailers and containers. The examiner held the oil traffic involved is not competitive.

Tennessee Central Employee Magazine

First edition of "The Highballer," the Tennessee Central's new employee publication, is currently being distributed. The new bi-monthly publication, edited by Troy Oswell, is directed by W. F. Bonney, TC comptroller.

The TC sponsored a "name-the-magazine" contest among its employees and received over 200 entries, from which the periodical's name was chosen.

British Will Use Commercial Frequencies

Considerable reduction in costs and improved service are expected to result from decision by the British Transport Commission to adopt a 25,000-volt, 50-cycle contact system for 1,210 route miles of the 1,460 miles in its electrification program.

The 50-cycle electrification plan, to cost about $520,000, will include 820 route miles of main line and 320 miles of suburban lines. There are 1,796 miles of track in the Southern region already electrified with a 660-volt, d-c system. This will not be changed to a-c, but under the new plan d-c electrification will be extended 250 miles.

Principal advantages of the a-c system, compared with d-c, are derived from the following differences: only 12 substations will be needed instead of 70; 68% less copper will be needed for the contact system; and steel for catenary supports will be reduced 17%. Instead of 250 miles of 33-kw feeder cable for power feeders, less than 17 miles will be necessary, and the aggregate capacity of the required transformers will be reduced one-third. Sixty fewer locomotives will be needed.

The 1,500 d-c system used in the Eastern region, and now in course of extension, probably will be changed to a-c. The 1,200-volt d-c Manchester-Bury electrification must be renewed in the near future and will probably be converted to a-c.

Direct cost of the commercial-frequency electrification is expected to be about 93% of the cost of d-c.

Tandem Trailers for Piggyback Service

What are said to be the first tandem truck trailers in piggyback service are in operation on the Western Pacific from San Francisco and Sacramento. Eight trailers of this type were purchased recently from the Freuhauf Trailer Company for use in the WP's piggyback service.

Pullman Rates Are Going Up May 1

Pullman rates will go up 7½% May 1, unless the Interstate Commerce Commission suspends the Pullman Company's new tariffs.

Based on the 1955 level of Pullman business, a 7½% increase in rates across the board will produce $6,800,000 annually in additional revenue. "This amount," Carroll R. Harding, president of Pullman, said, "while approximately the total of the latest annual increase in the company's labor costs, will leave nothing available to offset any of the earlier increases in wage and material costs incurred by Pullman since its last general increase in rates on June 1, 1951."

The ICC, citing the impact of sharply increased labor costs during the past year, granted Pullman permission to file tariffs providing for a general rate increase for interstate traffic and international traffic to and from Canada.

Corresponding adjustments in rates for intrastate traffic also are involved.

Mr. Harding said "this action was unavoidable. Of necessity, the company must apply wage and benefit patterns for the railroad industry to Pullman employees in similar categories. The additional labor cost to Pullman from applying to its employees the wage increases and fringe benefits gained by railroad employees in the past year amounts to $6,970,000 annually, inclusive of added payroll taxes. The proposed rate increase is supposed to offset this additional annual labor cost."

CA&E Would Drop Passenger Service

This week, hearings will begin before the Illinois Commerce Commission on a petition by the Chicago Aurora & Elgin to abandon its entire passenger service (Railway Age, Dec. 5, 1955, p. 12).

The road is prepared to produce evidence that its passenger operations have lost $2.3 million since through service from the western suburbs to the Chicago "Loop" was discontinued in September 1953.

Meanwhile, Governor William G. Stratton of Illinois has announced the state is trying to interest some other railroad in taking over the CA&E properties and continuing commuter passenger service. Frank W. Flannigan, CA&E president, told Railway Age he has not been ap-

Courtesy Gets More Than Its Own Reward

J. Monroe Johnson (left), Interstate Commerce Commissioner, presents annual "Railroad Man of the Year Award" to John J. Howley, 64-year-old conductor for the Jersey Central, at recent ceremonies in Washington, D. C. Award, consisting of a gold St. Christopher's medal and a $100 savings bond, is presented each year by the Federation for Railway Progress to a railroad employee who has distinguished himself for continuous and outstanding courtesy and service to the traveling public.

proached by any railroad interested in buying the road.

The Chicago Transit Authority has announced it will not purchase the CA&E, but that it would operate the CA&E's passenger service if the state would purchase the road and guarantee the Transit Authority against any possible operating losses.

The CA&E plans to continue its freight service. In the past year the road has doubled its freight revenues and expects the upward trend to continue. Freight revenues for February 1956 were $40,440, up from February 1955's $22,738.

Court Rules on Safety Appliance

Equipment on a freight car need not be required by regulations of the Interstate Commerce Commission to become a safety appliance covered by absolute-liability provisions of the Safety Appliance Act. The United States Supreme Court has so ruled, and in doing so it rejected contentions of the ICC itself.

The ruling was in a case docketed as No. 150, Shields v. Atlantic Coast Line. The car equipment involved was a so-called dome running board attached to the side of a tank car just below the dome and used in unloading operations. Shields, an independent contractor in the business of unloading gasoline, was working on a dome running board which broke, causing him to fall and sustain injuries.

He brought suit in the federal district court, winning a jury verdict which was reversed by the Circuit Court of Appeals for the Fifth Circuit. His appeal brought the case to the Supreme Court.

The ICC filed a brief contending, as the court put it, that "only appliances designed to insure safety while the train is in movement" are covered by the absolute-liability provisions of the Safety Appliance Act, and, "therefore, a dome running board cannot be a statutory running board." The court rejected this contention.

It also rejected the ACL's contention that it owed no duty under the Safety Appliance Act to one who was not its employee. Shields, it said, "was a member of one class for whose benefit" the dome running board "is a safety appliance under the statute"; and "the violation of the statute must, therefore, result in absolute liability."

The court's decision, announced by Justice Minton, was accompanied by a dissent from Justice Reed, with whom Justices Frankfurter and Burton agreed. They said the commission's construction of the statute should have been followed.

Kentucky Vetoes Belt Conveyor Bill

Governor A. B. Chandler of Kentucky has vetoed a bill which would have given operators of conduits, pipelines and conveyors the right of eminent domain to condemn rights of way. Both railroad and union leaders vigorously opposed the bill from its inception.

Supplementary List of Locomotive Export Orders

The following list of locomotives ordered for export in 1955 from the Electro-Motive Division, General Motors Corporation, and General Motors Diesel Ltd., supplements the tabulation of other export orders included in Railway Age, Jan. 9, p. 180.

Purchaser	No.	Wheel Arrangement	Service	Type	Weight Lb.	Horsepower	Date of Order	Date of Delivery	Builder
New Zealand Government	15	A1A-A1A	Rd.-Sw.	Diesel-Elec.	171,000	1425/1310	January	July '55-Sept. '55	GMDL
New Zealand Government Rys.	15	A1A-A1A	Rd.-Sw.	Diesel-Elec.	171,000	1425/1310	January	Sept. '55-Nov. '55	EMD
East Bengal Rys., Pakistan	15	A1A-A1A	Frt.-Pass.	Diesel-Elec.	170,000	1240/1125	February	Feb. '56-April '56	GMDL
Mexican Government Rys.	6	A1A-A1A	Rd.-Sw.	Diesel-Elec.	182,000	1425/1310	June	Dec. '55-Jan. '56	EMD
Israel Government	3	B-B	Rd.-Sw.	Diesel-Elec.	172,000	1425/1310	July	Feb. '56	EMD
Chile Exploration	5	C-C	Freight	Diesel-Elec.	375,000	1900/1750	September	March '56-April '56	EMD
Egyptian Republic Rys.	32	B-B	Rd.-Sw.	Diesel-Elec.	163,000	950/ 875	November	April '56-Oct. '56	EMD
Iranian State Rys.	70	B-B	Rd.-Sw.	Diesel-Elec.	176,000	1425/1310	November	May '56-Dec. '56	EMD
Orinoco Mining Company, Venezula	4	C-C	Freight	Diesel-Elec.	360,000	1900/1750	November	May '56	EMD

H. Neil Garson Is ICC's Assistant General Counsel

H. Neil Garson has been appointed assistant general counsel of the Interstate Commerce Commission. He has been on the commission's staff since 1949 and in the office of the general counsel since 1952.

Canadian RRs Boost International Rates

A general freight-rate increase of 6% has become effective on international freight traffic handled by Canadian railroads. The boost applies not only to movements between Canada and this country, but also to some export and import traffic involving Canadian ports. Exceptions to the general increase are rates on grain, livestock and fresh meats, which will be raised only 5%.

"Ticketeers" Improve PRR's Sales and Service

Forty-three high-speed ticket issuing and accounting machines known as "Ticketeers" are being installed in Pennsylvania Station, New York, as part of the PRR's $2,000,000 modernization program for the station's ticket office Railway Age, Feb. 20, p. 15). The "Ticketeers" are part of an order for 57 which will be leased from the Burroughs Corporation for installation at New York, Trenton, N. J., and Newark. An instructor is shown explaining operation of the new machine to ticket clerks at New York. Rack contains matrices (instructor holds one in right hand), which are inserted in "Ticketeer" to print on small ticket forms details of date, points of origin and destination, fare and tax. The PRR announced that the Turner Company, New York, has been retained as general contractor for the first phase of Pennsylvania station's ticket office modernization.

Financial

New York Central.—*Acquisition of Affiliates.*—This road has applied to the ICC for authority to acquire control of the Peoria & Eastern and the Beach Creek through ownership of their stock. P&E and BC are parts of the NYC system. Their stock would be acquired by NYC in exchange for $7,557,500 of its own collateral trust bonds. Authority is also sought to issue such bonds and to pledge as security $8,722,000 of Cleveland, Cincinnati, Chicago & St. Louis refunding and improvement mortgage bonds, series F, due January 1, 1964, and $3,861,000 of NYC refunding and improvement mortgage bonds, series C, due October 1, 2013. The NYC applications were accompanied by a supplemental application from Alleghany Corporation, seeking approval of the control of P&E and BC which it will acquire "as the company controlling New York Central."

New York, New Haven & Hartford.—*Providence Terminal Bonds.*—The ICC has authorized this road to extend for two years from March 1, 1956, the date of maturity of $3,564,000 of Providence Terminal Company first mortage bonds, with an interest rate of 4½% during the extended period. (Railway Age, Feb. 27 p. 34).

Seaboard Air Line.—*Stock Split.*—This road has applied to the ICC for authority to issue 4,898,950 $20-par shares of common stock to be exchanged on a two-for-one basis for $40-par shares now outstanding (Railway Age, Mar. 12, p. 70).

Southern. — *Stock Split.* — This road has applied to the ICC for authority to issue 3,984,600 shares of common stock without par value and 3,000,000 shares of preferred stock with par value of $20 per share, to effect splits of its no-par common and $50 preferred now outstanding. The common would be split on a 1½-for-1 basis and the preferred on a 2½-for-1 basis. The proposal will be submitted to Southern stockholders at a May 15 meeting, but the road hopes to have commission approval before that time.

Investment Publications

[The surveys listed herein are for the most part prepared by financial houses for the information of their customers. Knowing that many such surveys contain valuable information, *Railway Age* lists them as a service to its readers, but assumes no responsibility for facts or opinions which they may contain bearing upon the attractiveness of specific securities.]

Arnold Bernhard & Co. Inc., 5 E. 44th st., New York 17.

The Value Line Investment Survey. January 9, 1956, issue discusses the railroad and railroad equipment industries.

National Securities & Research Corporation, 120 Broadway, New York 5.

The 1956 Forecast.

Jas. H. Oliphant & Co., 61 Broadway, New York 6.

Oliphant's Economic Chronology, 1945-1955 Years to Remember.

Smith, Barney & Co., 14 Wall st., New York 5.

Kansas City Southern Railway Company; New York, Chicago & St. Louis Railroad Company Common Stocks. Railroad Bulletin No. 209, February 7.

Missouri Pacific Railroad Company. General 4s 1975; Debenture 5½s 1949. Railroad Bulletin No. 206, January 17.

Norfolk & Western Railway Company Common Stock. Railroad Bulletin No. 208, February 7.

Pocahontas Railroad Stocks. Railroad Bulletins Nos. 204, January 3, and 207, February 3.

Texas & Pacific Railway Company. Common Stock. Railroad Bulletin No. 205, January 13.

Vilas & Hickey, 49 Wall st., New York 5.

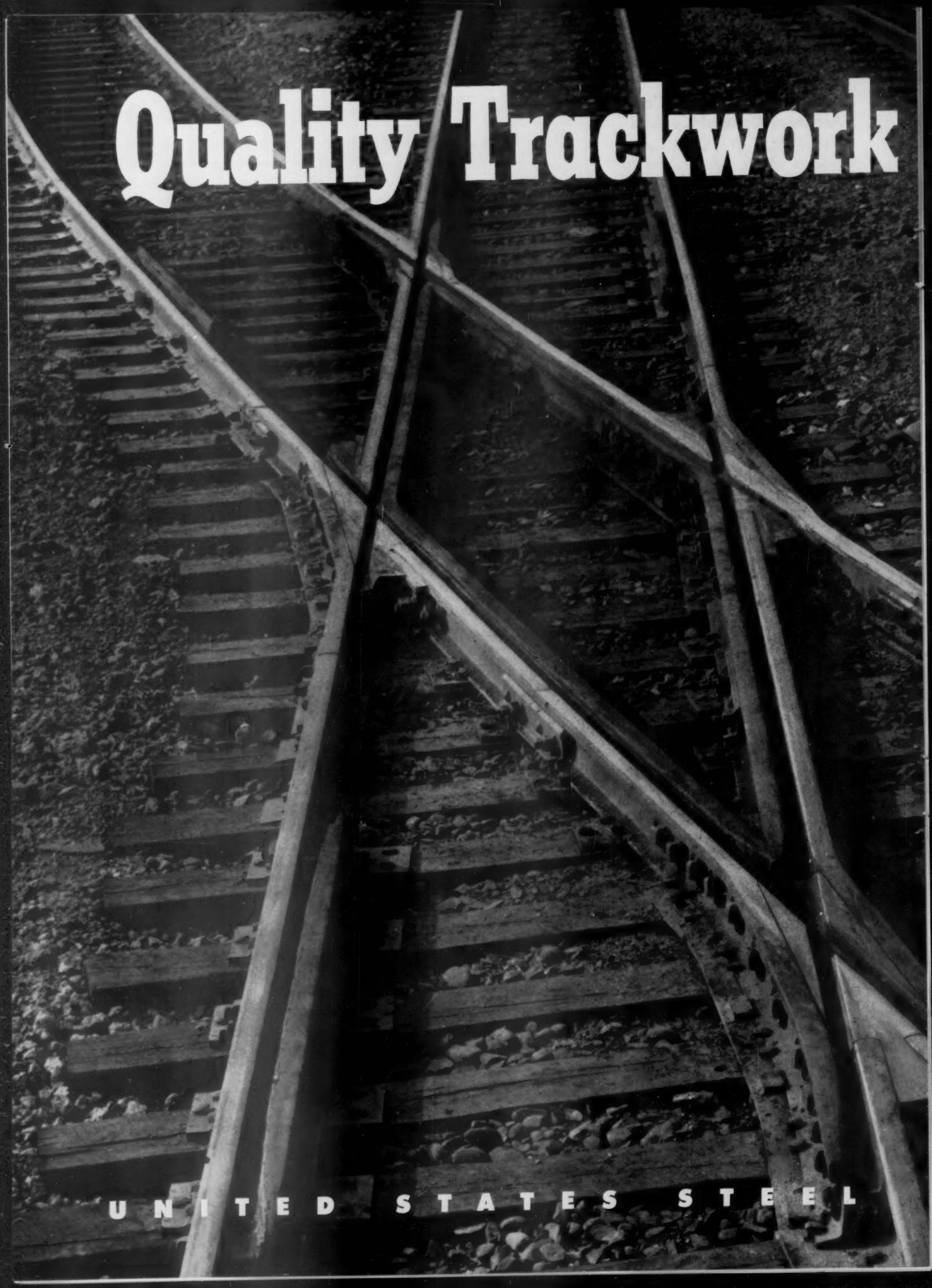
1956 Railroad Outlook. January 3.

Missouri Pacific, February 8.

Authorizations

CHESAPEAKE & OHIO.—To assume liability for $4,800,000 of equipment trust certificates to finance in part purchase of 62 diesel-electric units as first part of a proposed $9,600,000 issue (Railway Age, Jan. 30, p. 16). Division 4 approved sale of the securities at an interest rate of 3% for 99.0837—the bid of Salomon Bros. & Hutzler—which will make the annual cost of the proceeds to the road approximately 3.17%. Dated February 20, the securities are to

(Continued on page 16)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USS Quality Trackwork products possess an inherent strength and hardness that gives them longer life and results in greatly reduced maintenance. The extra care and effort that goes into the manufacture of switches, frogs and special track layouts makes USS Quality Trackwork the finest you can buy. Specify USS Quality Trackwork for all your requirements.

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(Continued from page 13)

mature in 15 annual installments of $320,000 each, beginning Feb. 20, 1957. They were reoffered to the public at prices yielding from 2.85 to 3.10%, according to maturities.

ILLINOIS CENTRAL.—To assume liability for $9,900,000 of equipment trust certificates to finance in part construction of 2,000 box cars (Railway Age, Mar. 5, p. 56). Division 4 approved sale of the securities at an interest rate of 3% for 99.585—the bid of Salomon Bros. & Hutzler—which will make the annual cost of the proceeds to the road approximately 3.07%. Dated March 1, they are to mature in 30 semiannual installments of $330,000 each, beginning Sept. 1, 1956. They were reoffered to the public at prices yielding from 2.70 to 3.05%, according to maturities.

LOUISVILLE & NASHVILLE.—To assume liability for $3,645,000 of equipment trust certificates to finance in part purchase of 28 diesel-electric units (Railway Age, Mar. 5, p. 56). Division 4 approved sale of the securities at an interest rate of 3% for 99.4109—the bid of Halsey Stuart & Co.—which will make the annual cost of the proceeds to the road approximately 3.11%. Dated March 15, the securities will mature in 15 annual installments of $243,000 each, beginning March 15, 1957. They were reoffered to the public at prices yielding from 2.80 to 3.05%, according to maturities.

Dividends Declared

BEECH CREEK.—50¢, quarterly, payable April 1 to holders of record March 15.

CHICAGO & EASTERN ILLINOIS.—common, 25¢, quarterly; extra, 25¢; both payable March 28 to holders of record March 14; $2 Class A, $1, payable May 1 to holders of record April 16; $2 Class A, $1, payable November 1 to holders of record October 15.

ELMIRA & WILLIAMSPORT.—common, $1.19, semiannual, payable May 1 to holders of record April 20; 7% preferred, $1.65, semiannual, payable July 2 to holders of record June 20.

PHILADELPHIA & TRENTON.—$2.50, quarterly, payable April 10 to holders of record March 29.

SOUTHERN (M. & O.)—Stock Trust, $2, semiannual, payable April 2 to holders of record March 15.

WESTERN MARYLAND.—7% 1st preferred, $1.75, quarterly; 2nd preferred, $1, initial quarter; both payable March 29 to holders of record March 19.

Organizations

Allegheny Regional Advisory Board.—Regular meeting will be held in the Hotel William Penn, Pittsburgh, March 22. Commissioner Owen J. Clarke, of the Interstate Commerce Commission, will speak at a luncheon session.

American Short Line Railroad Association.—Annual meeting will be held in Denver, Colo., September 25-26, at the Brown Palace Hotel. This was decided by the association's executive committee after it was learned that lack of hotel accommodations prohibited carrying out original plan to hold the meeting in San Francisco.

American Society of Traffic and Transportation.—Tenth anniversary meeting will be held in the Fairmount Hotel, San Francisco, September 20-21. A. P. Heiner, president of the society's California chapter, and vice-president public relations and traffic, Kaiser Steel Company, is general chairman of arrangements.

Bituminous Coal Research, Inc.—The third techno-sales conference and annual meeting of members will be held April 18-19, in the Deshler Hilton Hotel, Columbus, Ohio. The 1955 operations of the Locomotive Development Committee will be described by Peter R. Broadley, director of research, and William M. Meyer, assistant to the director of the Locomotive Development Program.

Cincinnati Traffic Club.—New officers are: President, A. L. Kreamelmeyer, general traffic manager, Eagle Picher Company; first vice-president, George G. Taylor, general agent, Cushman Motor Delivery; second vice-president, R. J. Meehan, traffic manager, Albers Super-Markets; third vice president, M. F. Connor, general agent, Northern Pacific; secretary H. F. Oehlschlaeger, general agent, Monon; treasurer, E. A. Whiting, traffic manager, S. A. Gerrard Company.

Federation for Railway Progress.—W. P. Kennedy, president, Brotherhood of Railroad Trainmen, will be principal speaker at the Ninth Annual Railway Progress Dinner, in the Sheraton-Park Hotel, Washington, March 22.

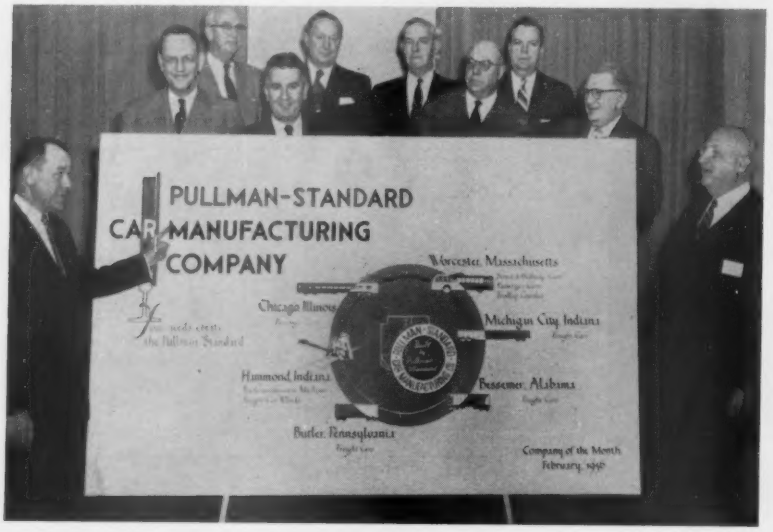
Great Lakes Regional Advisory Board.—The 33rd annual meeting will be held in the Hotel Commodore Perry, Toledo, Ohio, March 27-28.

Pacific Northwest Advisory Board.—Annual meeting is scheduled for March 22-23 at Portland, Ore. Guest speaker at the luncheon March 23 will be Charles Holloway, vice-president of sales, Portland Gas & Coke Company.

Pacific Railway Club.—Annual meeting and dinner will be held in the Sheraton-Palace Hotel, San Francisco, at 6:30 p.m., March 22, with Dr. John O. Christianson, superintendent, University of Minnesota School of Agriculture, as speaker; his subject—"Our Part in These Times."

Railroad Enthusiasts, New York Division.—Harry F. Brown, consulting engineer, Gibbs & Hill, will discuss "The Future of Railway Electrification" at a meeting at 8 p.m., March 23, in the YMCA Auditorium, Pennsyvania Station.

Traffic Club of Philadelphia.—New Officers are: President, Joseph A. De George, district sales manager, Waterman Steamship Corporation; first vice-president, John T. Deering, supervisor, motor carrier transportation, Atlantic Refining Company; second vice-president, Thomas H. Ramsey, freight traffic manager, Reading.



For Distinguished Service to the Free Market

Lewis A. Evans (left), president of the Belt of Chicago and the Chicago & Western Indiana, representing the Henry George School of Social Science, cites Pullman-Standard as the company of the month for February 1956. Each month the school honors a company "distinguished for its service to and through the free market." Pullman-Standard president, Charles W. Bryan, Jr. (right), acknowledges receipt of the award as other Pullman-Standard officers look on. Left to right are C. B. Faverty, director of manufacturing; T. P. Gorter, vice-president in charge of sales; T. C. Gray, vice-president—engineering; G. L. Green, vice-president—sales; J. A. Kummerer, director of purchasing; O. C. Maier, director of research and development; J. W. Scallan, vice-president and general manager; and A. W. Walter, the company's vice-president—finance.

DEDICATED TO BETTER RAILROADING

The Ton-Mile

MARCH 1956

THE TONNAGE TRAVELS BY RAIL: A 300-ton steel tower is lifted into place in the midst of an oil refinery.

ORIGINAL WOOD ENGRAVING BY B. BRUSSEL-SMITH

confidence . . . and the X-2 wheel

An overwhelming vote of confidence has been cast for our new AARX-2 steel wheel—over *fifty* railroad customers have ordered more than 100,000 of these 1.5% carbon wheels in the first brief year of commercial production.

Behind this acceptance of the Southern® cast steel wheel are eight years and nearly six million car-miles of road service. Not one wheel failure has occurred.

On such records of performance is true confidence built.

SOUTHERN WHEEL DIVISION

AMERICAN **Brake Shoe** COMPANY

230 PARK AVENUE, NEW YORK 17, N. Y.

The **Ton-Mile**
dedicated to Better Railroading

Redipak Lubricating Pads *designed to reduce* Hot Box Costs

Recent interest by the railroads in the use of journal lubricating devices to supplant cotton waste has focused attention on the Redipak*—American Brake Shoe's lubricating pad which was developed expressly to overcome the disadvantages inherent in waste packing.

Developed by National Bearing Division of American Brake Shoe Company, the Redipak lubricating pad offers a simple, economical solution to the car journal bearing lubrication problem. Used in place of cotton waste in the journal box, it should provide improved lubrication both winter and summer, and reduce cost of operation as it requires less frequent attention.

Waste often cannot function

Hot boxes, product of lubrication failure, can often be traced to a break in the flow of lubricating oil to the underside of the rotating journal or interruption of the lubricating film between journal and bearing.

On hot summer runs cotton waste may lose resiliency and sag away from the journal, cutting off the flow of oil. Hot boxes occur most frequently in summer.

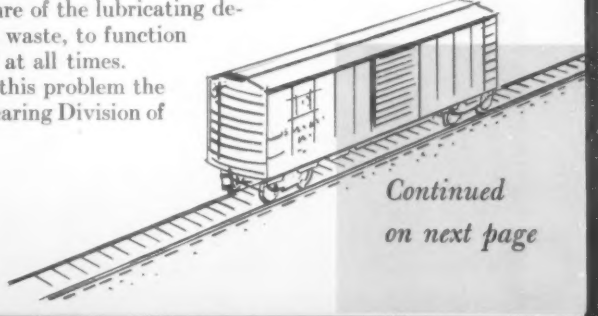
Under the impact of accelerating and decelerating forces during switching, waste may become displaced away from the journal. Again, a hot box results.

In yard humping and coupling operations displaced waste may easily enter between journal and bearing. Here, in the "waste grab", strands of waste carried between the journal and the bearing break the continuity of the oil film. The result is local overheating which may wind up as a hot box. Waste grabs may occur at any time. In cold weather waste frequently adheres to the journal and is carried up to the bearing. All these conditions require frequent attention to reset the waste, involving delay and expense. Interruption of the lubricating film is a common cause of hot boxes.

We turned to research for an answer to this problem

The solid journal bearing is both simple and efficient. Wherever heavy impact loading is encountered and complete dependability is required, whether in railroad cars or fine machinery, engineers *usually* specify this type bearing. As with any bearing system, lubrication is essential. The hot box problem, then, centers around failure of the lubricating device, cotton waste, to function as intended at all times.

To solve this problem the National Bearing Division of



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*Trademark of American Brake Shoe Company

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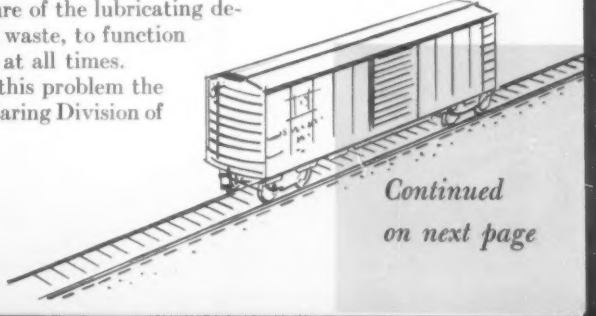

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*Trademark of American Brake Shoe Company

Our research showed a foam neoprene core encased in a special cotton wicking cover gave positive lubrication at all temperatures

American Brake Shoe Company recently undertook a comprehensive research and engineering program at its Journal Bearing Laboratory at Mahwah, N. J. The test machine, an axle with standard A.A.R. journals, rotates at equivalent speeds to 115 mph. It can be accelerated and braked rapidly. Each journal box can be loaded to 40,000 lbs.

Every factor is controlled and recorded

This dynamometer is mounted in a room where temperatures can be controlled between −40°F and 125°F. Loads, speeds and temperatures can be varied to duplicate any desired "run". Speed, loading, starting and running frictions, air temperature and temperatures at 26 points in the bearings, housings and oil are recorded automatically.

From our broad knowledge of journal bearing operating problems and from the results of simulated operating tests at all operating speeds and loads, and at air temperatures of 125°F to −40°F, we evolved basic requirements for a successful bearing lubricator.

Qualities of an ideal lubricator

The ideal journal bearing lubricator should be a highly absorbent pad, highly resilient, have good capillarity, be non-abrasive, insoluble, unaffected by oil or water, and acid-resistant. It should maintain these characteristics at temperatures from −40° to 375°F.

In service, the pad must feed enough oil to the journal for proper bearing lubrication; be non-glazing; and not shed lint, fibers, or loose strands to adhere to the rotating journal. It must be of simple design, easy to install or remove, and provide large oil reserve capacity for safe operation, even on the longest run, when all oil in the journal box has been consumed.

Against these demanding requirements many materials were quickly eliminated. Almost a hundred materials were tested to find the best combination of characteristics for a better lubricating medium.

Almost a hundred different kinds and types of materials were tested to find the combination of properties which would meet the exacting demands for an ideal lubricator.

Redipak meets these requirements

The Redipak lubricating pad has been designed to meet these requirements. The unit is a square block of foam neoprene molded with cored passages and covered with cotton wicking of high capillarity. It provides a continuous flow of clean oil under varied operating temperatures.

The Redipak lubricating pad is inserted between the journal and the bottom of the journal box. The resilient foam neoprene holds the cover against the underside of the journal. Cored passages within the foam neoprene act as pumps and permit a large volume of oil to saturate the neoprene which has an open-cell structure. This keeps the wicking cover soaked with oil which is transferred to the journal and bearing as the axle turns. Once thoroughly saturated, it can operate for extended periods with no free oil in the box.

Best results with the Redipak are obtained in journal boxes with cast-in-place restraining ribs. Boxes without such ribs can be modified by welding a short length of angle iron along each side, or one of several types of waste retainers may be used to help position the pad.

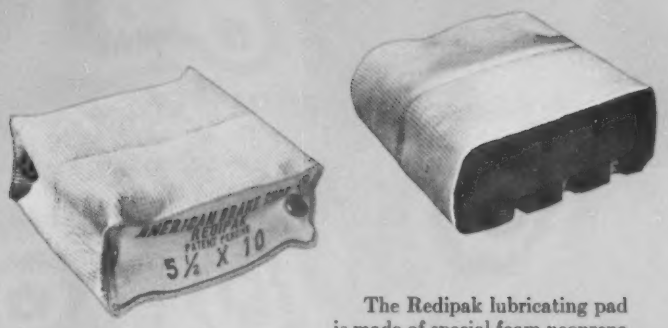
Why Redipak does a better job

Redipak's superior lubricating properties stem from the unusual combination of physical properties of the materials used. The specially processed neoprene core has excellent compressive strength, resiliency, and abrasion resistance. These properties remain comparatively unchanged despite continued exposure to oil, chemicals, heat, freezing, sunlight, ozone and natural aging.

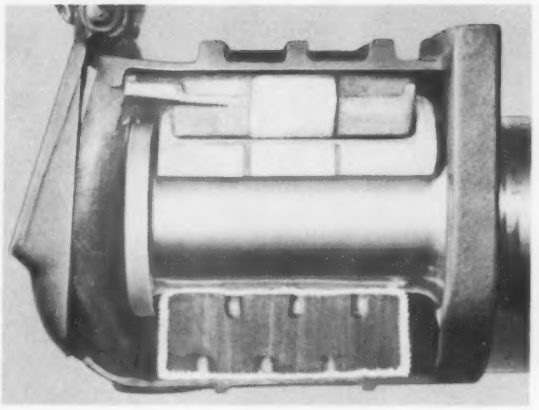
Two weaves are used in the cotton container. End panels, of standard wicking material, are reinforced through the center for extra strength where the grommets are installed. The remainder is made of a special rib-weave material which appears to have innumerable hills and valleys. The hundreds of tiny oil reservoirs formed by the valleys of the special weave used in the Redipak cover maintain a copious supply of oil at the pad surface. With minimum contact area there is a maximum supply of oil at the rotating journal.

The cloth used to make the container is highly absorbent and has excellent capillarity. With 3 in. immersed in oil, this material will raise car oil 15 in. The material does not

Simple, foolproof, economical—the square Redipak lubricating pad is installed either face up, any side out.



The Redipak lubricating pad is made of special foam neoprene with molded core passages which act as pumps to keep clean oil flowing freely. The foam neoprene core is encased in a cotton wicking cover of high capillarity. Sturdy corner grommets simplify removal from the journal box.



Pressure from the foam neoprene keeps the cotton wicking cover in constant contact with the journal, thus assuring a constant flood of clean oil under all operating conditions.

glaze and will not shed lint, fibers, or loose strands to adhere to the journal. It is non-abrasive and generates little heat from journal rubbing when saturated with oil. The material is not permanently affected after having been frozen in water. Double nylon stitching is used throughout for strength. All sewn edges are hemmed to insure that there will be no loose ends.

Grommets simplify removal from journal box

Grommets in each corner permit the pads to be readily removed with a hook at all times and under any applications. Grommets reinforce the sides of the fabric and eliminate the need for a handle or other protruding part which might contact the rotating journal.

The Redipak lubricating pad, made in five sizes to fit most standard journal boxes, has been designed for simple, rapid installation. It is square, symmetrical top and bottom, and can be installed either side up, any edge out. Pads may be installed without tools and removed with a standard packing hook.

Redipak lubricating pads are saturated with oil before installation. They may be soaked in oil (at not less than 70°F) for 24 hours, or, where the installation must be made at once, the pad can be submerged in oil and squeezed together and released a number of times. In either case, excess oil is drained off.

Prior to installation the journal box should be thoroughly cleaned. The oil-soaked pad is inserted vertically through the journal box opening and worked under the journal. For low-cost production maintenance, a special tool, the Redipaker, was developed which simplifies and speeds up the insertion of Redipak lubricating pads.

Maintenance is more accurate, more consistent

After the pad is inserted, free oil is added to the 2 in. level. This excess oil compensates for oil squeezed out of the pad during insertion. After initial oiling, oil level is maintained at ½ in. to 1 in.

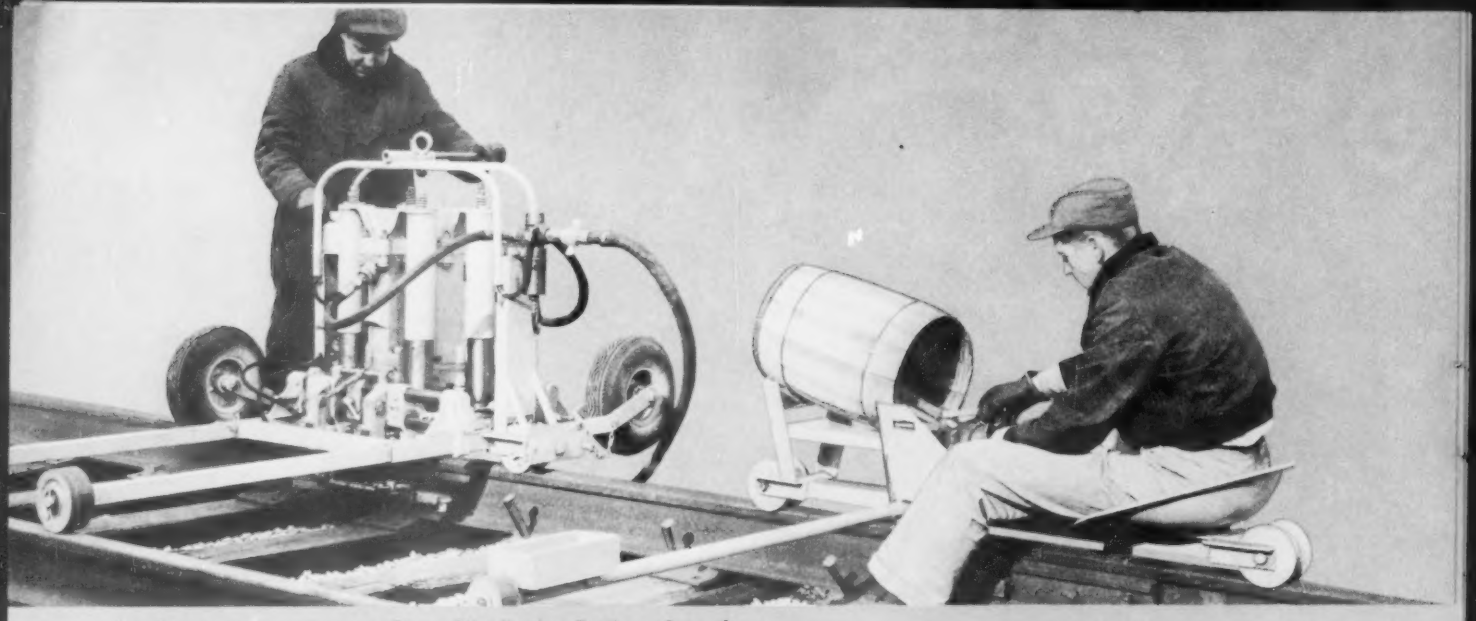
Redipak lubricating pads eliminate a major deficiency in the maintenance of waste packing. The quantity of waste in a journal box can vary from 6 to 9 lbs. Redipak lubricating pads provide a cartridge of constant weight, bulk and axle pressure which cannot be varied at the discretion of the individual and which will not vary in service. In these respects they give accuracy and consistency to journal box maintenance. Redipak lubricating pads are easily removed with a packing hook which has had the point ground off, or with a hook made from ⅜ in. bar stock.

Redipak gives greater protection on longest runs

Under certain conditions the Redipak lubricated bearing has operated as much as 50°F. cooler than waste-lubricated bearings. In laboratory starvation tests, with no free oil in the box, the Redipak lubricating pads have retained enough oil for 10,000 miles of high speed operation.

In service tests, Redipak lubricating pads have operated over 90,000 miles without noticeable wear and without glazing. Inspection of bearings shows the pads do not lint. Average temperature of journals lubricated with Redipak pads is appreciably lower than those lubricated by waste.

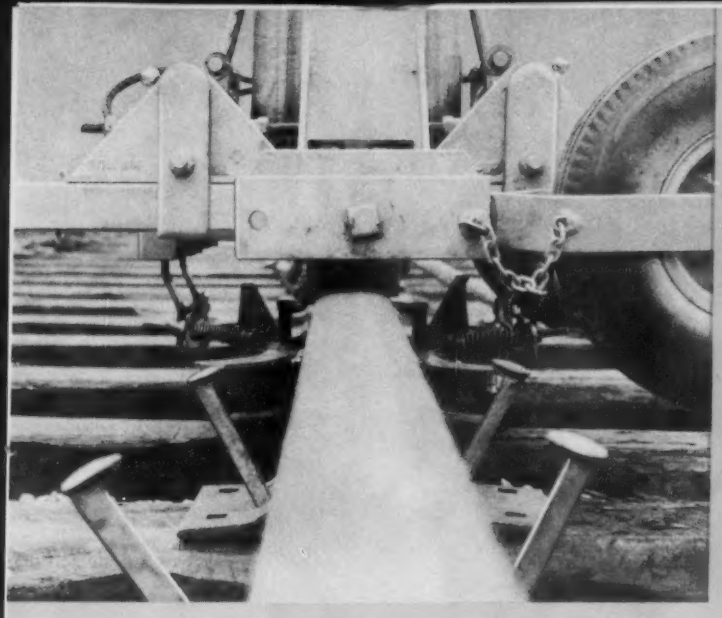
A.A.R. permission has been granted for a substantial number of Redipak lubricating pads to be placed in interchange service.



A spiking team—one man on a Racor Distributing Carriage places the spikes loosely in the line spike holes. Another man drives two spikes at once by operating the control handle of the DD4. Release of the control handle readies the Dual Driver for the next pair of spikes.

New Racor Dual Driver

The DD4 in action! All the advantages of a powerful pneumatic hammer, yet one man drives twice as many spikes without relief or fatigue. Costly hand setting of spikes is eliminated.



The spikes are automatically picked up and held vertical for driving by the Dual Driver. The spikes may be leaned either toward or away from the rail as shown here.

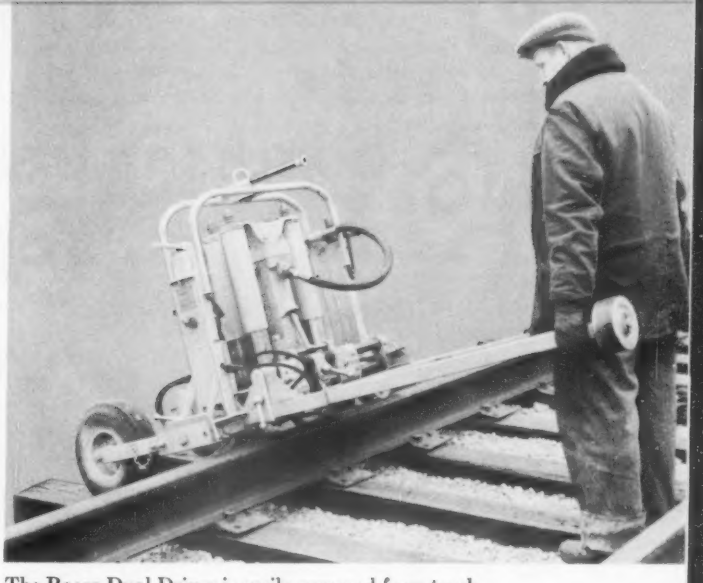
cuts line spiking costs!

Actual experience on many miles of track has *proven* that the Racor Dual Driver DD4 effects substantial reduction in line spiking costs:

One man can easily drive at least twice as many spikes as any other spike driver. After spikes are distributed to the tie plate holes, the DD4 positions them for driving, drives two spikes at once, and automatically resets for the next pair of spikes.

The DD4 can also drive Racor Studs!

Why not see how this new Racor Dual Driver can best fit into your own maintenance-of-way plans? Your Ramapo representative will be glad to consult with you about your road's specific conditions and requirements.



The Racor Dual Driver is easily removed from track.

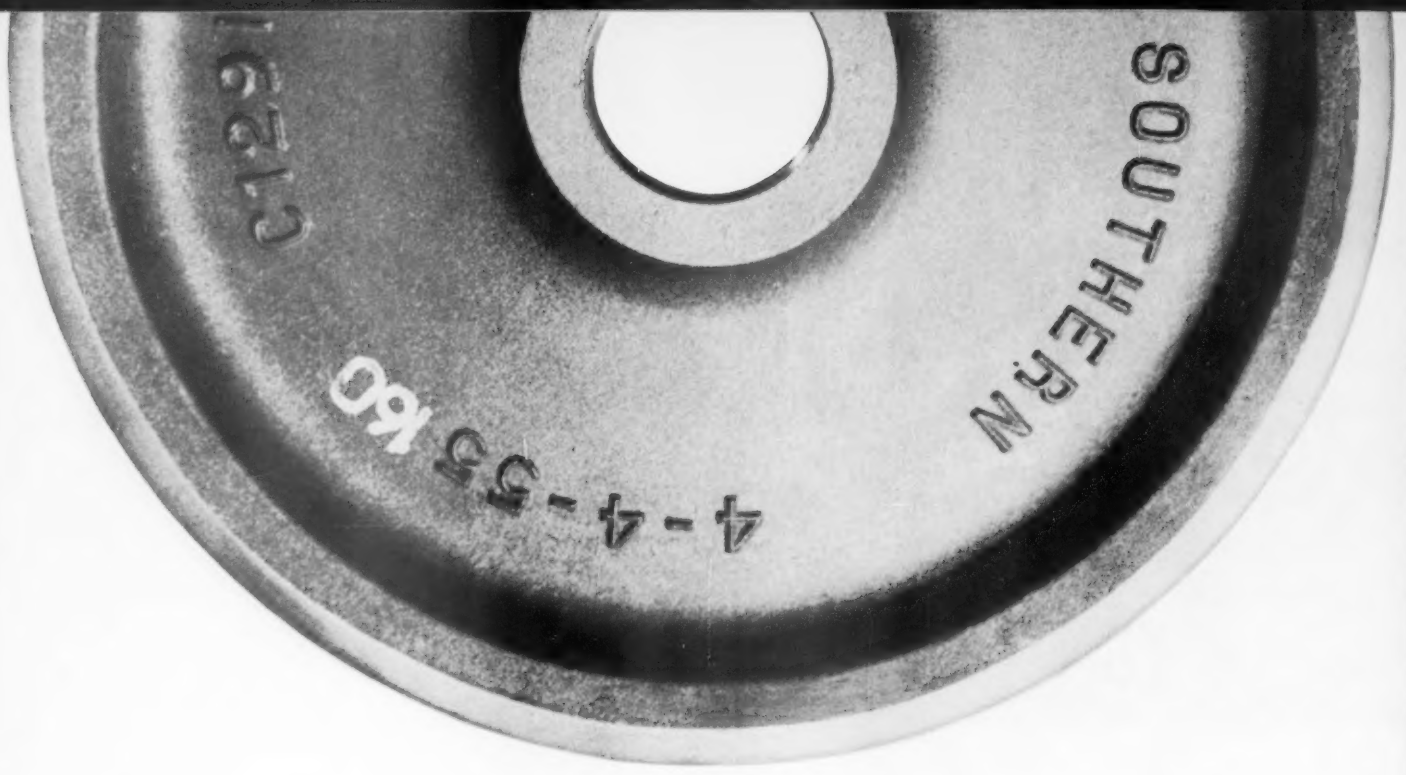
Also drives Racor Studs! The Racor Dual Driver can quickly be adapted in the field for driving Racor Studs in the anchor position of the tie plate.

AMERICAN
Brake Shoe
COMPANY

RAMAPO AJAX DIVISION

CHICAGO 6, ILLINOIS

IN CANADA: DOMINION BRAKE SHOE CO., LTD.



Southern® Cast Steel Wheel...

better resistance to heat, wear, abuse

Southern cast steel wheels have rolled up more than six million miles under cars belonging to nineteen railroads and private car lines operating in every part of the country under every extreme of climate. Some have traveled as much as 370,000 miles. In direct test comparisons, resistance to wear has exceeded or equalled that of other types of steel wheels.

The Southern cast steel wheel was developed to meet a long unfilled need: To provide the railroad industry with a wheel combining the desirable qualities of other types of steel wheels with the economy of a cast wheel.

The success with which this need has been met is the result of the thorough research and engineering, improvements in manufacturing methods, and the extensive program of testing carried out by the Southern Wheel Division of American Brake Shoe Company since 1941.

Steel engineered to withstand heat, abrasion, impact

The Southern cast steel wheel is a 1.5 percent carbon steel with a chemical analysis and metallurgical structure especially developed to withstand the combination of heat, abrasion, and impact to which railroad freight car wheels are subjected.

Starting with a material carefully selected to meet the specific requirements of modern railroad operation, Brake Shoe metallurgists combed every detail of manufacturing procedure to assure a wheel which would be commercially successful. The methods chosen guarantee high output of a precision product at low cost.

Every modern and proved concept of foundry operation, guided by Southern's extensive experience in casting wheels by highly mechanized methods, has been embodied in the completely new plant built solely for production of the Southern cast steel wheel. This new facility, at Calera, Alabama, closely approaches the ideal in straight-line, continuous-flow foundry operation. Some 300 wheels per day are now rolling out of this plant.

Every production step carefully controlled

For utmost control of metal analysis, electric furnace melting is used. Time-proven sand casting techniques have been modernized and mechanized for practical commercial production. By carefully controlling every step of manufacture—from weighing of ingredients in the sand mix through the selection, blending and melting of metals, together with skillful bottom pouring—a cast wheel with the desired basic characteristics is obtained.

Double heat treatment gives best physical properties

Optimum physical properties in Southern cast steel wheels are obtained by using a closely controlled double heat treatment. This process develops to the fullest the inherently outstanding qualities of Southern's 1.5 percent carbon steel. Grain structure is refined, internal stresses are relieved, and carbides are spheroidized to produce an extremely wear resistant metal with a high degree of toughness.

In this process the wheels are first slowly cooled in annealing pits and then subjected to electronically controlled two-stage heat treatment in special continuous furnaces. Throughout its manufacture the Southern cast steel wheel is subject to closest chemical, metallurgical, and dimensional control. A full history of each wheel is thoroughly checked for adherence to specifications by the resident inspector and reviewed by the plant metallurgist. A consistently round, uniform product of the highest standards of quality is assured.

Each wheel is then precision machined, at a single chucking, on special automatic vertical turret lathes. In one operation the wheel is rough bored, finish machined on front hub and rim face, and turned to standard A.A.R. wheel tread and flange contour with secondary taper. The circumference of the finished tread thus falls within a limited range of three predetermined tape sizes. Dimensional accuracy and rotundity are assured in this method of machining. The result is a better balanced wheel, with longer life and easier ride for any load.

Field tests proved the cast steel wheel's value

The true test of any wheel is its service record. To establish beyond doubt the complete soundness of every detail of its new steel wheel, the Southern Wheel Division of American Brake Shoe Company, with the cooperation of U. S. and Canadian railroads, undertook a comprehensive field testing program.

Southern cast steel wheels were first placed in test on the Bangor & Aroostook Railroad in July, 1947. Test wheels under a 50-ton rack car, subject to a constant load of 10½ tons per wheel and operating in temperature extremes of freezing winter and hot summer, piled up mileage at the rate of 5000 miles per month.

After two years' successful experience on the Bangor & Aroostook, the scope of field testing was expanded through agreements with individual railroads handling cars over assigned routes. By 1955, wheels were being tested by 19 different railroads and carlines throughout the country on every type of freight car and under every service condition.

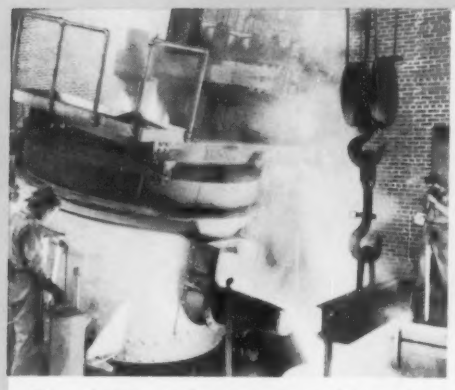
Gives more ton-miles per dollar

To obtain a direct basis for comparison, it has been Brake Shoe's policy to place its cast steel wheels and conventional steel wheels in every test car truck on a 50-50 basis. In such tests Southern's cast steel wheels have equalled or outperformed the comparison wrought steel wheels. Since Southern cast steel wheels cost less than other steel wheels, there is a direct saving in original equipment cost and a greater return in ton-miles per dollar, the true measure of wheel value.

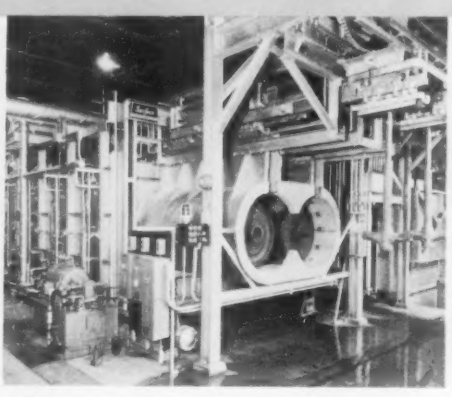
The Southern cast steel wheel has been designed and produced for modern railroad operating requirements. For all practical purposes it can be regarded as any other one-wear steel wheel. It is bored and mounted in accordance with conventional steel wheel shop practice. Hubs are bored on conventional mills with table speeds from 15 to 125 rpm using conventional cutters. Mounting tolerances and pressure limits are the same as those for other steel wheels.

Before shipment all Southern cast steel wheels are carefully inspected, taped, weighed, and gaged. Wheel tape size is checked, then stenciled on front and back plates. Southern cast steel wheels can be condemned for wear with existing standard A.A.R. wrought steel wheel gages. Prominent lettering on the back plate permits ready identification. Owners of cars equipped with Southern cast steel wheels are fully protected under A.A.R. Rules of Interchange.

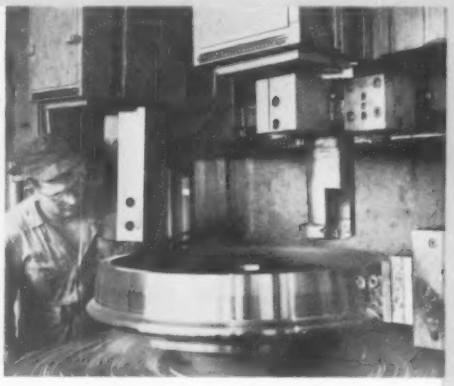
Southern cast steel wheels, the product of years of research and the wheel industry's most modern and precise manufacturing methods, have been vividly described in both brochure and a color movie, "The First Five Million Miles." Today, on railroads throughout the United States and Canada, Southern cast steel wheels are setting new standards for wheel performance, safety and economy.



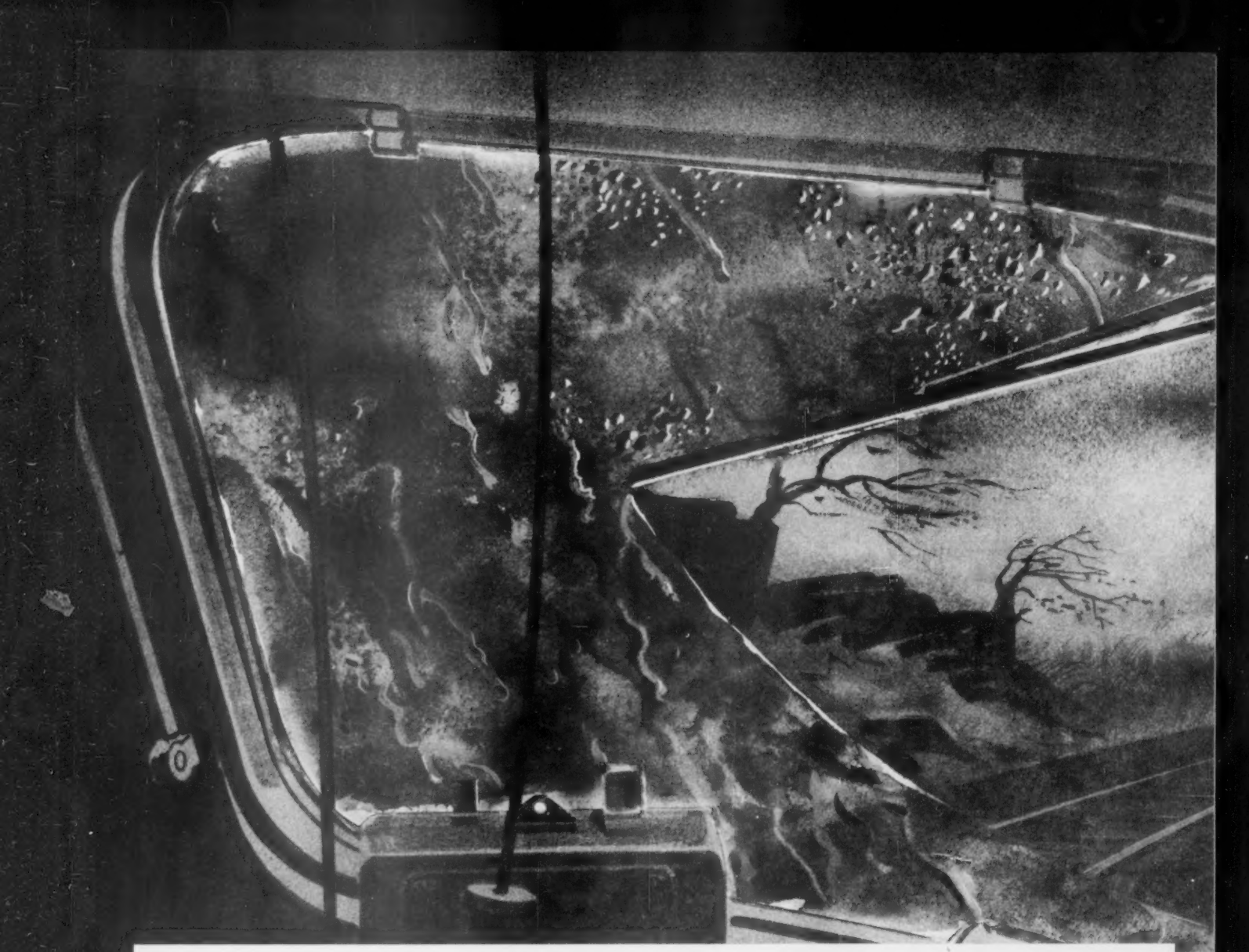
Four electric arc furnaces are used to maintain uniformity of steel analysis. As the metal is poured its temperature is checked by optical pyrometer.



Two-stage heat treatment takes place in special furnaces. The electronically controlled cycle lasts 16 hours.



A battery of four vertical turret lathes automatically machines Southern cast steel wheels. All finished surfaces are machined at one chucking.



Dependability

What lies ahead?

When the signal says slow, it takes only the touch of an experienced hand to keep the train under sure control. Rain or shine—in summer's heat or winter's ice—railroad men all over America rely on today's braking systems . . . and on time-proven Diamond S brake shoes . . . for utmost dependability.

What lies ahead in brake shoes? Only continued research and laboratory testing, together with countless miles of road service, will tell. But one thing is sure: Tomorrow's progress will be built on today's solid foundation of utmost dependability.

You can depend on it.

BRAKE SHOE AND CASTINGS DIVISION

IN CANADA: DOMINION BRAKE SHOE COMPANY, LTD.

AMERICAN **Brake Shoe** COMPANY

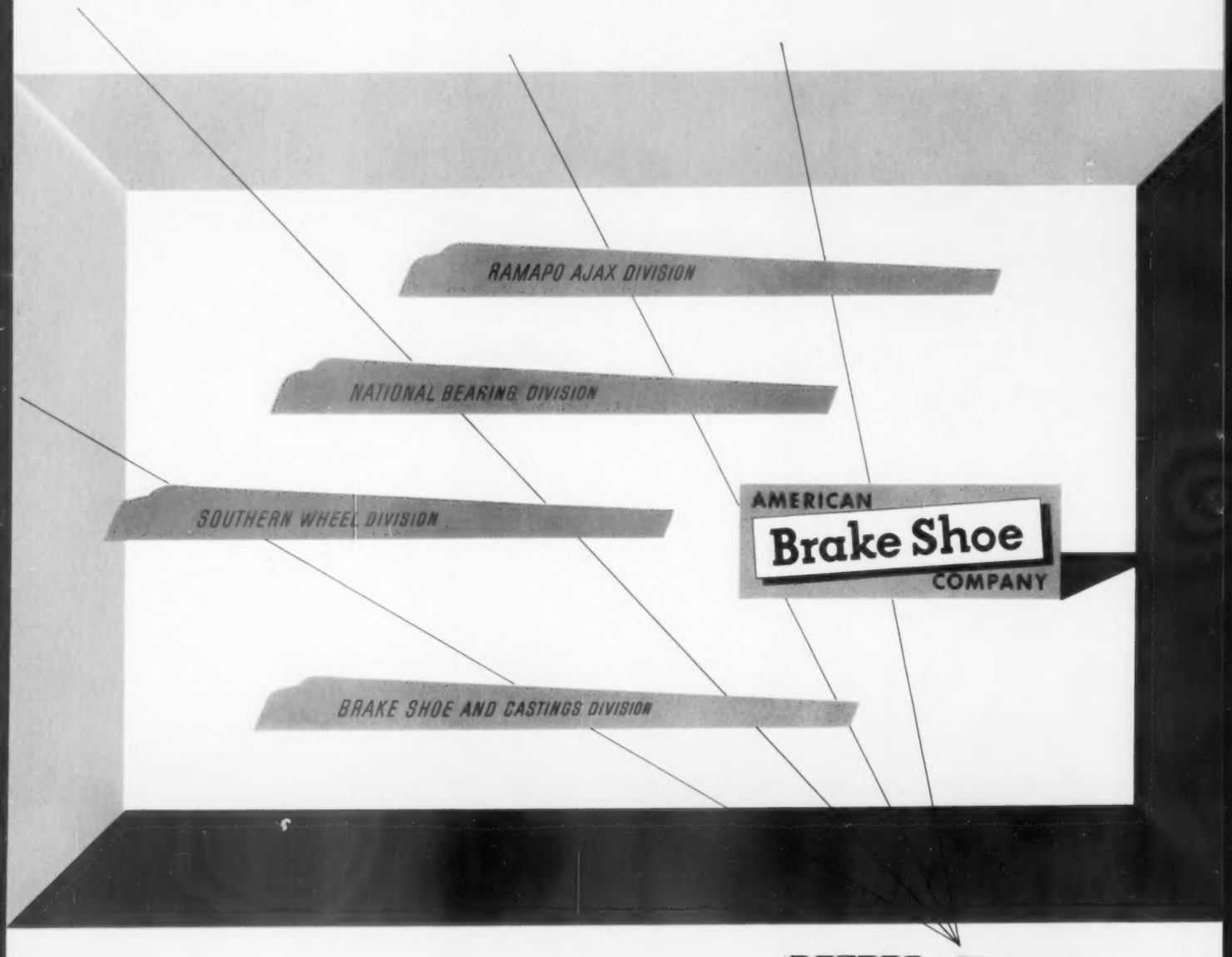
Why Brake Shoe
means Better Railroading

American Brake Shoe's research center at Mahwah, New Jersey, is constantly engaged in the search for design, metallurgical, and performance advances in railroad equipment which will make sound economic sense and which will withstand the practical test of time.

American Brake Shoe's various manufacturing Divisions have amassed many years of valuable experience in working closely with American railroads helping them work out practical solutions to specific operating problems.

From this union of forward-looking research and thoroughly documented experience comes Brake Shoe's unique contribution to the railroad industry—a combination made up of advanced engineering . . . quality manufacturing . . . competent service—to help you in your efforts toward *Better Railroading.*

AMERICAN BRAKE SHOE COMPANY • 230 PARK AVENUE • NEW YORK 17 • N. Y.



BETTER RAILROADING

World's most powerful wheel rolling mill—

puts extra mileage in

EDGEWATER WHEELS

The homogeneous structure of the steel in Edgewater railroad wheels is an important factor in producing maximum service life. This characteristic is the result of advanced metallurgical practices which insure the quality of steel and carefully control the heating and forging operations. Without reheating, Edgewater's rolling process expands the rim to size and forms the flange. Every step in the manufacture of Edgewater Rolled Steel Wheels is carefully controlled to insure the optimum properties in the finished product.

The photograph shows a rolled wheel being removed from the rolling mill. After controlled cooling and when specified, heat treating, Edgewater Railroad Wheels are machined to exacting A.A.R. standards.

E

Edgewater Steel Company PITTSBURGH 30, PA.

Makers of Rolled Steel Wheels for Freight Cars, Passenger Cars and Diesel Locomotives

"ROLLER FREIGHT"

In 1955 alone: 31 railroads and private roller bearings for 6441 more freight cars—

HERE ARE SOME OF THE RECENT "ROLLER FREIGHT" ORDERS:

CAR by car, train by train, more and more railroads are making the switch to "Roller Freight" by ordering freight cars equipped with Timken® tapered roller bearings. Since the start of last year, "Roller Freight" has been gaining momentum at the rate of more than 17 cars a day. Orders in 1955 exceeded the previous five years combined.

By putting Timken bearings on freight cars, the railroads are realizing important operating economies, largely through the reduction of hot boxes and inspection costs, and are taking a big step forward in bringing better service to their shippers. And 1813 cars, owned by seven of these railroads, are being placed in general interchange.

The switch is really on! The day is drawing nearer when all railroads will enjoy the benefits of "Roller Freight" and will save millions of dollars per year in operating costs. The Timken Roller Bearing Company, Canton 6, Ohio. Cable address: "TIMROSCO".

IS ROLLING!

car owners have ordered TIMKEN®
1813 of them to be used in general interchange

Another "Roller Freight" Flash

FRISCO IS NEWEST ROAD TO GO "ROLLER FREIGHT" WITH 200 NEW CARS

Another "Roller Freight" Flash

NEW HAVEN TO PUT 400 NEW "ROLLER FREIGHT" BOX CARS IN INTERCHANGE SERVICE

Another "Roller Freight" Flash

NOW IT'S THE LOUISIANA AND ARKANSAS GOING "ROLLER FREIGHT" WITH

Another "Roller Freight" Flash

BOSTON AND MAINE ORDERS 800 NEW "ROLLER FREIGHT" BOX CARS FOR INTERCHANGE SERVICE

Another "Roller Freight" Flash

READING JOINS GROWING LIST OF RAILROADS GOING "ROLLER FREIGHT"

Another "Roller Freight" Flash

NORTHERN PACIFIC ADDS 100 "ROLLER FREIGHT"

Another "Roller Freight" Flash

CHICAGO GREAT WESTERN TO SPEED SERVICE ADDING 80 MORE

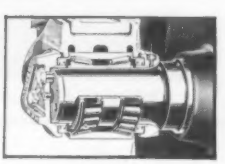
Another "Roller Freight" Flash

GREAT NORTHERN ORDERS 200 BOX CARS ON TIMKEN BEARINGS FOR INTERCHANGE SERVICE, DOUBLES ITS "ROLLER ROLLING STOCK

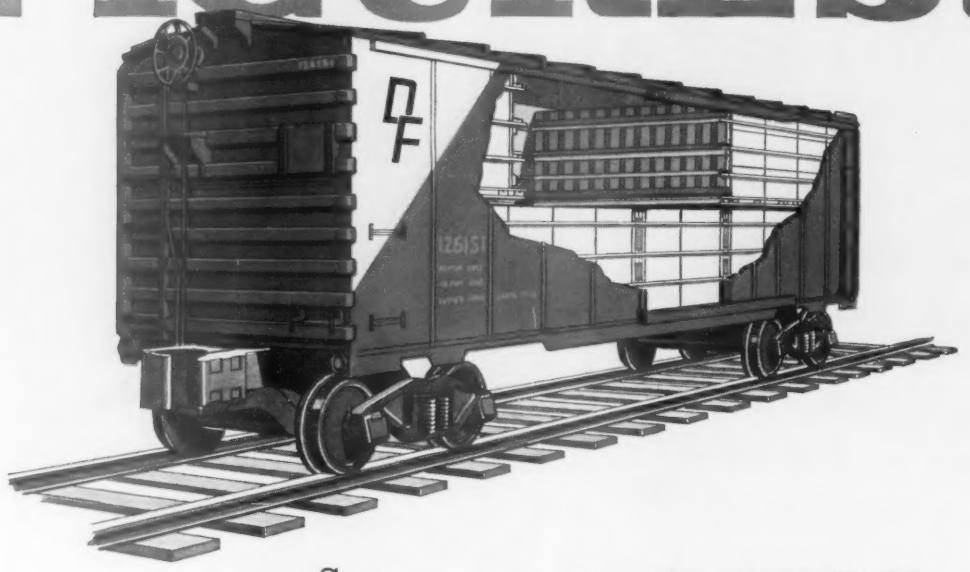
BOX SCORE TO DATE OF ALL RAILROADS WITH 20 OR MORE "ROLLER FREIGHT" CARS

AKRON, CANTON & YOUNGSTOWN
ALASKA RAILROAD
ATCHISON, TOPEKA & SANTA FE
ATLANTIC COAST LINE
BALTIMORE & OHIO
BOSTON AND MAINE
CHESAPEAKE & OHIO
CHICAGO, BURLINGTON & QUINCY
CHICAGO GREAT WESTERN
DULUTH, MISSABE & IRON RANGE
ERIE
GREAT NORTHERN
LOUISIANA AND ARKANSAS
NICKEL PLATE ROAD
NEW HAVEN
NORTHERN PACIFIC
PENNSYLVANIA
QUEBEC, NORTH SHORE & LABRADOR
READING
ST. LOUIS—SAN FRANCISCO
SOUTHERN RAILWAY
UNION PACIFIC
WABASH
WESTERN MARYLAND
WESTERN PACIFIC

TIMKEN
TRADE-MARK REG. U. S. PAT. OFF.
TAPERED ROLLER BEARINGS



How to make money in BOXCAR FIGURES!



Specify cars that are Evans DF* equipped! The DF increases revenue for the railroad. Shippers can get DF at no extra cost! DF equipped cars virtually eliminate damage to lading in transit. Costly dunnage becomes a thing of the past, too. In DF cars, there is no danger of slack . . . no damaging load shift. And with DF you can double-deck, get heavier loads.

Today, heavier loads per DF car are increasing revenue per car mile for forty-four Class I railroads.

Railroad or shipper, the sooner you investigate Evans DF equipped cars, the sooner you will start making money in **"boxcar figures."**

*DF *is a trademark of the Evans Products Company...only Evans makes it.*

EVANS DF LOADER ... LOCKS IN LADING, ELIMINATES DAMAGE AND DUNNAGE

FREE BOOKLET! There's much more to the DF story of interest to both railroads and shippers. Write today for your copy of this interesting brochure, to Evans Products Co., Dept. E-3, Plymouth, Mich.

(Advertisement)

A CARBUILDER REPORTS ON TRAIN X

This interview with Charles W. Bryan, Jr., President, Pullman-Standard Car Manufacturing Company, highlights the carbuilder's expectations for passenger carrying equipment.

Charles W. Bryan, Jr., President,
Pullman-Standard Car Manufacturing Company

For more than two years the railroad industry has been looking forward to building and delivery of new, lightweight, low silhouette passenger train designs from the plants of the carbuilding industry and others.

Now, with deliveries of this new equipment taking place, the railroad industry is expectantly eyeing preliminary performance and evaluating how new equipment of the Train X type will fit into the passenger carrying operations of individual roads. With delivery of the first Train X to the New York Central scheduled for April and with a second train to come later for the New Haven, Pullman-Standard's President, Charles W. Bryan, Jr., was prompted to participate in this interview. In it Mr. Bryan expands points made in an earlier interview, and answers questions concentrated on Train X and the passenger equipment pattern for the immediate and long range future.

Q . . . Mr. Bryan, early last year you reviewed the passenger traffic situation confronting the railroads and highlighted the expectations for the future of both Train X and conventional passenger carrying equipment. Do you, today, see any reasons to change the viewpoints of your company from what they were ten months ago?

A . . . In May, 1955, I was pleased by an invitation to serve as spokesman for the entire Pullman-Standard organization on the subject of passenger equipment. At that time I stated our opinion that there was a definite and important mass transportation role ahead for the low silhouette lightweight cars and trains of the Train X type. And I believed then, as I do now, that there is also a wide area wherein the traveling public will be better served by and consequently grant greater acceptance to passenger cars of a more conventional nature. The opinion within the Pullman-Standard carbuilding organization is that there is no reason to alter or abandon the beliefs that both types of passenger equipment have their merits and that each can serve the public and the railroads equally well in the type of service for which it was designed.

Q . . . Train X has been the subject of railroad industry discussion for some time. How long has Pullman-Standard been building Train X?

The first Train X, to be delivered to the New York Central, in April, is low-slung, lightweight and revolutionary in design. Its unique suspension arrangement provides unusual passenger comfort, even on high speed curves. And its special acoustical provisions keep noise levels at a pleasant minimum.

A . . . I suppose that you could say we've been working on Train X for something over five years. You see, exploratory planning and early Train X thinking resulted from long-range projection of passenger equipment needs by Robert R. Young and our company. As far back as 1950 we built and tested prototype Train X cars that were sparked by Mr. Young's far-sighted perspective. Before actual operating trains could be produced and put into service, however, the Korean War and other factors caused us to slow down the pace of Train X planning until recent years.

Since mid-1955 we have been building Train X to fill orders from the New York Central and the New Haven railroads. Of course, while much exploratory engineering and testing had been done, complete review and reconsideration of changed railroad needs, design advances, today's production techniques and newly developed materials were considered advisable to insure that Train X would be absolutely up-to-the minute in every respect.

Q . . . Then, when will Train X be delivered?

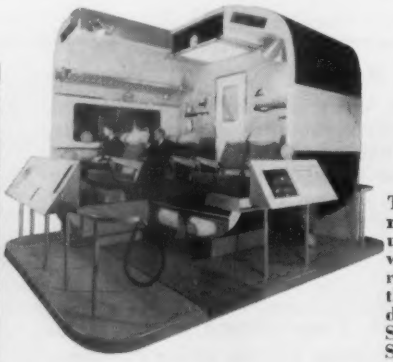
A . . . We are approaching some exciting days for both Pullman-Standard and the railroad industry . . . specifically for Mr. Young and the New York Central. We plan to deliver the first Train X to the New York Central in April, and, of course, will share with Mr. Young the satisfaction of seeing this long-range dream come to life.

Q . . . April delivery means that fourteen months will have passed since the New York Central ordered Train X. Couldn't Pullman-Standard have made earlier delivery?

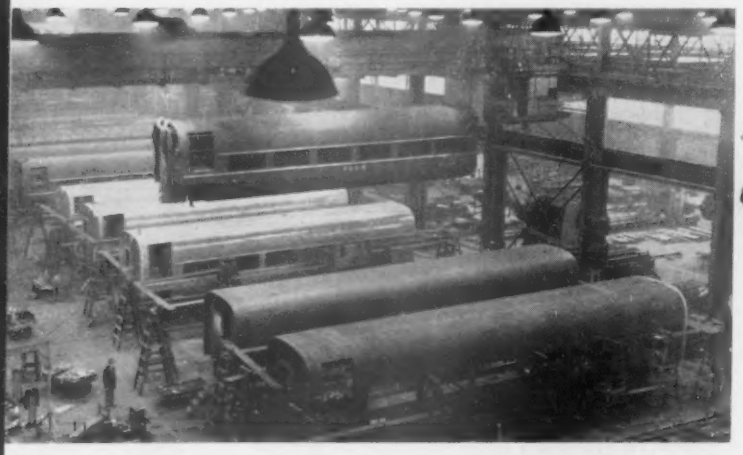
A . . . Of course. For some months now we have been well into the Train X building stages with prototype cars in test. But in keeping with our custom, as the world's largest builders of rolling stock, we resisted the impulse to advance Train X delivery dates by cutting down on detailed testing and proving. Experience has shown us that pretesting is vital to rolling stock in-service performance. Our methodical approach to Train X assures us that it will represent not only a remarkable railroad equipment advance but also an expression of the kind of design, engineering, research, testing and craftsmanship that have kept Pullman-Standard the leader in the carbuilding field for 89 years.

Q . . . Since not everyone can see Train X being built in your shops, have you any means of previewing it?

A . . . We certainly have. With Train X delivery still some weeks away, we felt that a preview of its appearance and construction would be of interest to the railroad industry and the public. Therefore, we have prepared a full scale cut-away



This full size cut-away model of a Train X car-unit gives a preview of what travelers and railroads will experience in the actual train. It is on display at the Pullman-Standard Michigan Avenue Showroom, Chicago.



Train X cars being built at the Pullman-Standard Car Works, Chicago, receive the skillful craftsmanship of the world's largest carbuilder. Modern production facilities and specialized carbuilding equipment help change designs and careful tests into actual Train X cars.

model of one car-unit to demonstrate contour, seating, decor, suspension and other pertinent details. This colorful presentation is on display in our Michigan Avenue Showroom, Chicago, and can be seen there. Everyone is invited and our personnel will be pleased to explain the exhibit.

Q . . . What Train X features will be highlighted in this exhibit?

A . . . Train X has dozens of exclusive and outstanding features, but specifically, our exhibit will call viewers' attention to its low center of gravity, roll compensating suspension and bi-directional air-glide ride. Train X acoustic design for minimizing noise and vibration will be stressed. And viewers will see Train X braking, lighting, air-conditioning and other features that mean safety and comfort.

Q . . . Has your company's experience with freight car standardization exerted any influence on Pullman-Standard's approach to building passenger equipment?

A . . . Yes, indeed. While the products differ tremendously, there are certain basic carbuilding principles that apply to rolling stock of any kind. As you know, Pullman-Standard has been the leading proponent of freight car standardization for ten years. The concept of offering carbuilder pre-engineered, completely tested freight cars, mass produced with the benefits of production precision and economy was introduced to the railroad industry by Pullman-Standard in 1946. We call these "Standardized" freight cars, and they incorporate in their designs the characteristics specified by the hard and diverse operating conditions of the railroads and their shippers throughout the entire Great American Railway System.

Since these operating conditions change, our standardized freight cars include sufficient design flexibility to permit inclusion of improvements and advances without losing the meaning or owner-benefits of standardization. We believe that the basic standardization theories that have been so well accepted in freight equipment can also be successfully applied to both conventional and Train X type passenger cars through pre-engineering, pre-testing and mass production.

Q . . . How well has standardization of freight cars been accepted by the railroad industry?

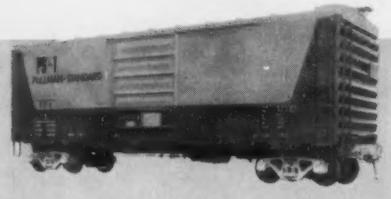
A . . . That our concepts of standardization were found worthwhile is proved by more than 120,000 PS-1 Box Cars, PS-2 Covered Hoppers, PS-3 Open Hoppers and PS-4 Flat cars that have been built or are on order. Since the first Standardized Box Car, the PS-1, was delivered to the Lehigh Valley, nearly one out of four of all U. S. box cars built are PS-1 Standardized Box Cars . . . this means over 85,000 PS-1s for 75 railroads and thirteen other users.

PS-3 Open Top Hopper Car. Rugged strength in 50 and 70 ton sizes.

PS-4 Flat Car. All purpose, standardized for general or special service.

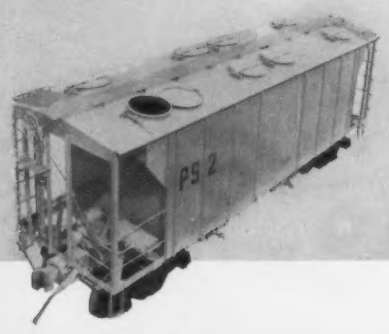
Q . . . How can standardization be applied to passenger cars, since they differ so completely from freight equipment?

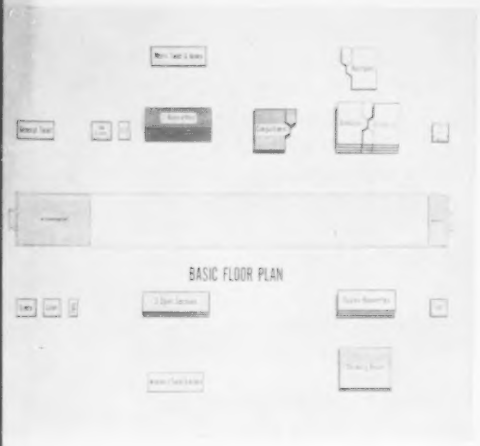
A . . . The standardization principles that proved so advantageous in freight cars are being included in Pullman-Standard plans for Train X. You see, we are certain that Train X will earn acceptance, and are making plans for other buyers to economically purchase new trains of this type by taking advantage of all the work that has already been done. We plan to offer several versions of Train X. While we believe its immediate importance is in the field of all-coach travel, we expect to eventually broaden Train X use by someday including diners, sleepers and other deluxe accommodations. Basically, the pre-engineered designs will be standardized. The basic and costly structural engineering and much tooling for the trains have already been accomplished, testing has been completed and many of the most expensive production steps have been taken. This means that many of the highly

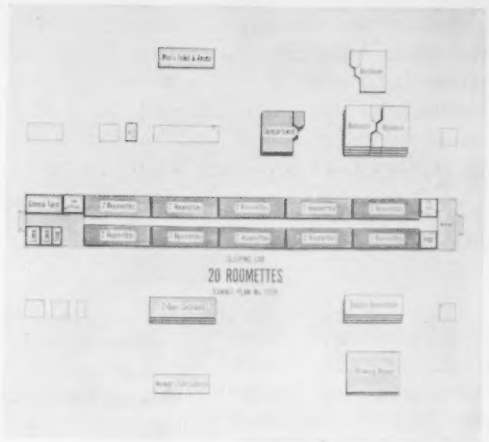


PS-1 Standardized Box Car. Over 85,000 on order or built for 75 railroads and thirteen other users.

PS-2 Covered Hopper Car. For clean, dry shipment of bulk lading.







Modular Planning—Basic outline floor plan covers an 85-foot long car, with air conditioning and vestibule locations. Around the car are shown pre-engineered units or modules, the use of which gives flexibility in plan arrangements.

Modular Planning—Basic sleeping rooms and sections are engineered as units, together with electric lockers, general toilets, air conditioning installations, linen and equipment lockers, etc., into a desired floor plan to meet buyers' specifications.

detailed and man-hour-using operations that make custom carbuilding so expensive can be eliminated or reduced, and the savings reflected in the first cost prices of future standardized Train X versions.

Q . . . Well, hasn't Pullman-Standard been applying this same theory to conventional passenger equipment for some time now?

A . . . Yes. We have been working for some time with a form of standardization we call Modular Construction. This means that, in conventional equipment, pre-engineered and standardized modules of passenger accommodations can be combined and varied within the structure of a similarly pre-engineered and standardized 85-foot car. In this case, too, decor, fabrics, skin treatment and other details allow expression of railroad individuality, but many of the unnecessarily high costs demanded by complete custom building are eliminated. Whether applied to freight cars, Train X, or conventional passenger equipment, the element of standardization represents overwhelming benefits to the railroad industry. Within today's economy, buyers who insist on custom built equipment are not enjoying all the advantages available to them. Of course, for those who demand completely customized lots of cars, Pullman-Standard can and will build to the most exacting specifications.

Q . . . Then with Train X already considered a standardized product, what conventional passenger equipment has been standardized through modular construction?

A . . . We have engineered, pre-tested and tooled for a wide variety of 18 types of conventional passenger cars such as: Coaches, dome cars, two-level suburban coaches, sleeping cars with combinations of accommodations, parlor- bar- lounge cars and baggage cars, to name only a few.

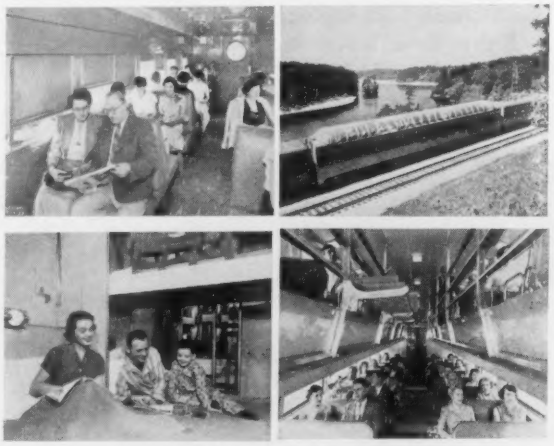
And the standardized multiple variations available through Modular Construction gives almost endless combinations of accommodations and options without customization penalties. The most complex passenger carrying needs of any railroad can be met by some combination of standardized cars with standardized accommodation modules.

Q . . . Do you then think that standardization of rolling stock will be instrumental in saving the future of the railroad industry?

A . . . We, at Pullman-Standard, do not think that the railroad industry needs saving. Despite overtaxation, Governmental restrictions, subsidized competition and a thousand and one other annoying hurdles, the railroads are plowing ahead and remaining well in the lead at the forefront of American Transportation. We do feel that the economic benefits we can offer through standardized rolling stock, and traveler-pleasing new equipment like Train X, will help the railroads do an even better and more profitable job of keeping America and its products on the move.

High capacity coaches have been pre-engineered and offer buyers the benefits of s andardization.

Full length domes, while standardized, include sufficient flexibility of design to allow expression of railroad individuality and identification.



Sleeping accommodations, in standardized modules, can be integrated in car plans to meet buyers' specifications at maximum economy.

The P-S Standardized line includes pre-engineered passenger equipment of eighteen types, including new two-level commuter cars.

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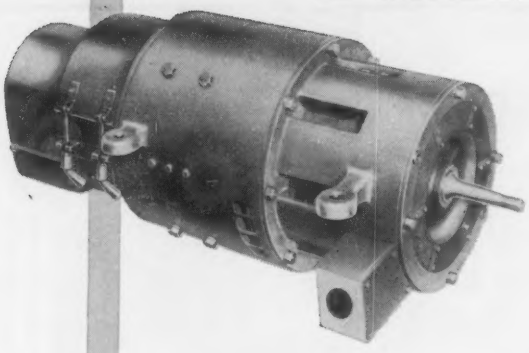

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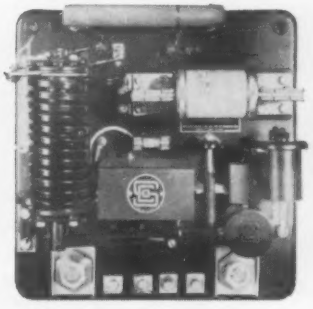

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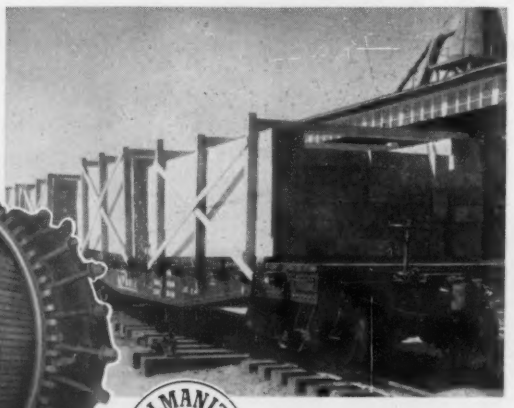

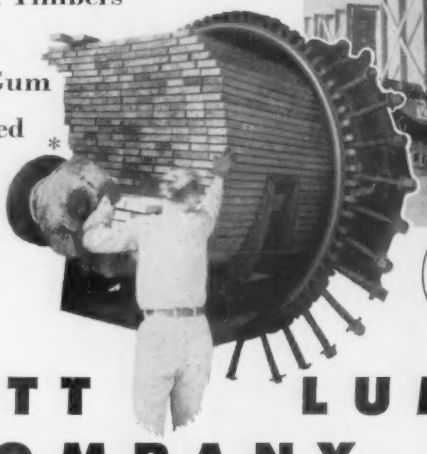

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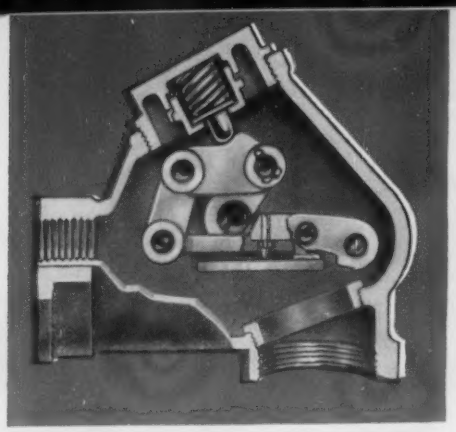

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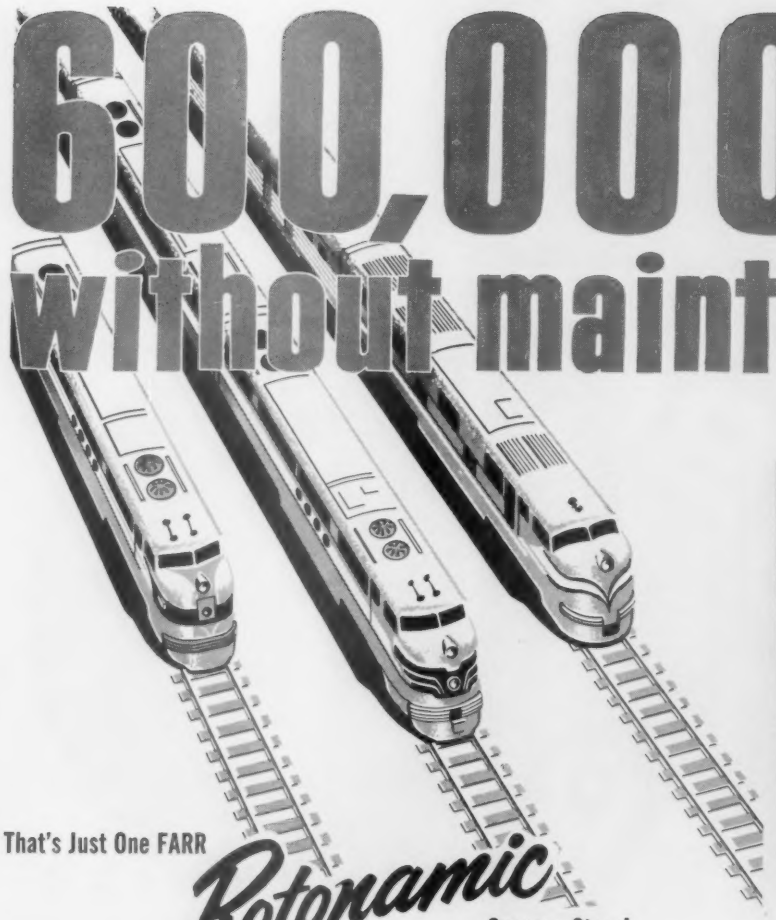

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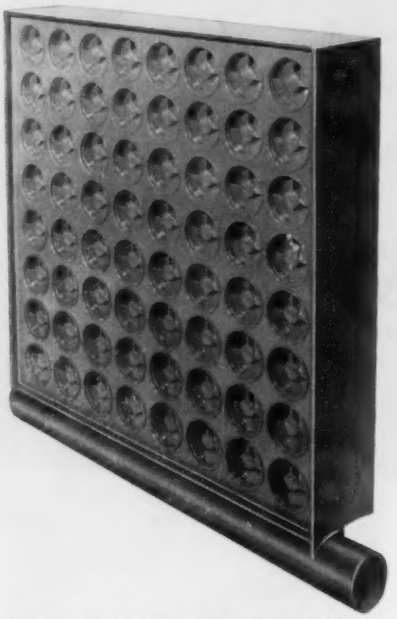
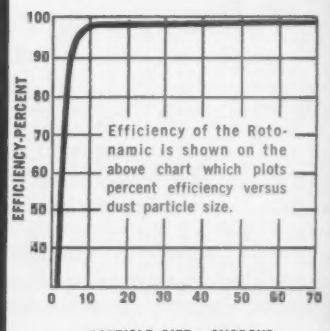
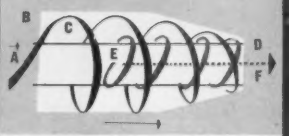


Check the Rotonamic Efficiency



Efficiency of the Rotonamic is shown on the above chart which plots percent efficiency versus dust particle size.

Here's How the Rotonamic Works



Dust enters the inlet tube (a) and deflector vanes (b) set up a cyclonic action. While traveling along the primary chamber (c) dust particles are centrifuged towards the walls and carried into a special dust bin at (d) by the 10% Bleed-off air. The remaining 90% of the air reverses direction, spirals back along the discharge tube (e) centrifuging the remainder of the dust. Clean, filtered air reverses direction once again and exits at (f). The dirt laden air is discharged to atmosphere.

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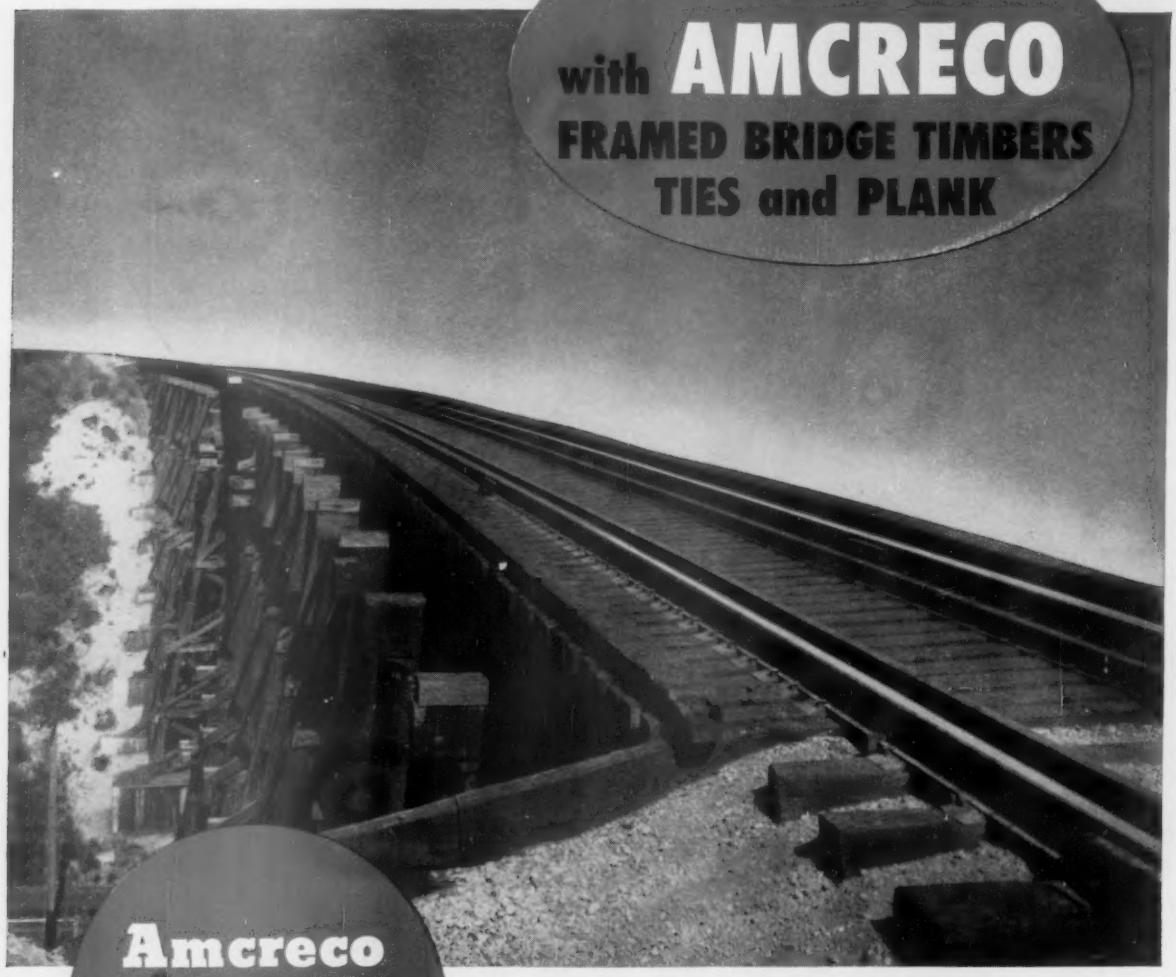

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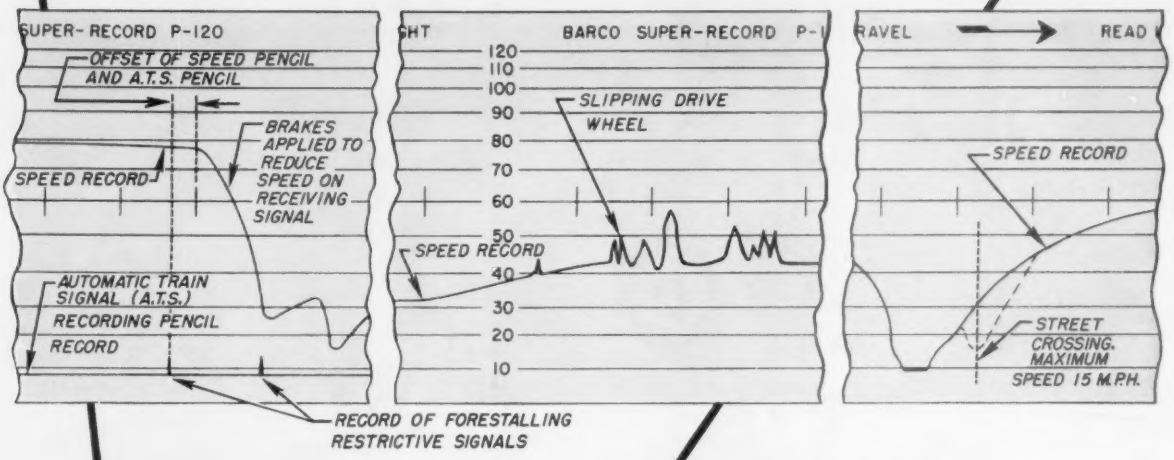

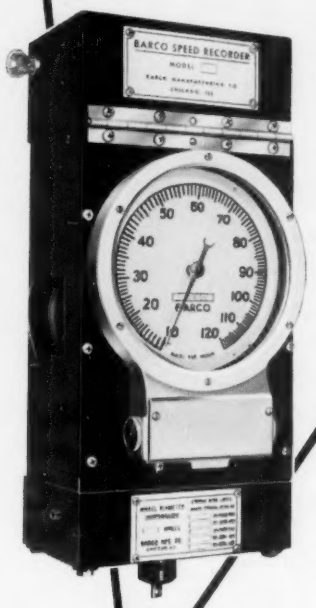

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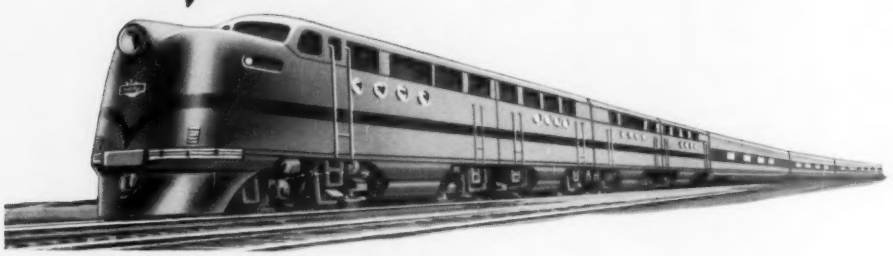

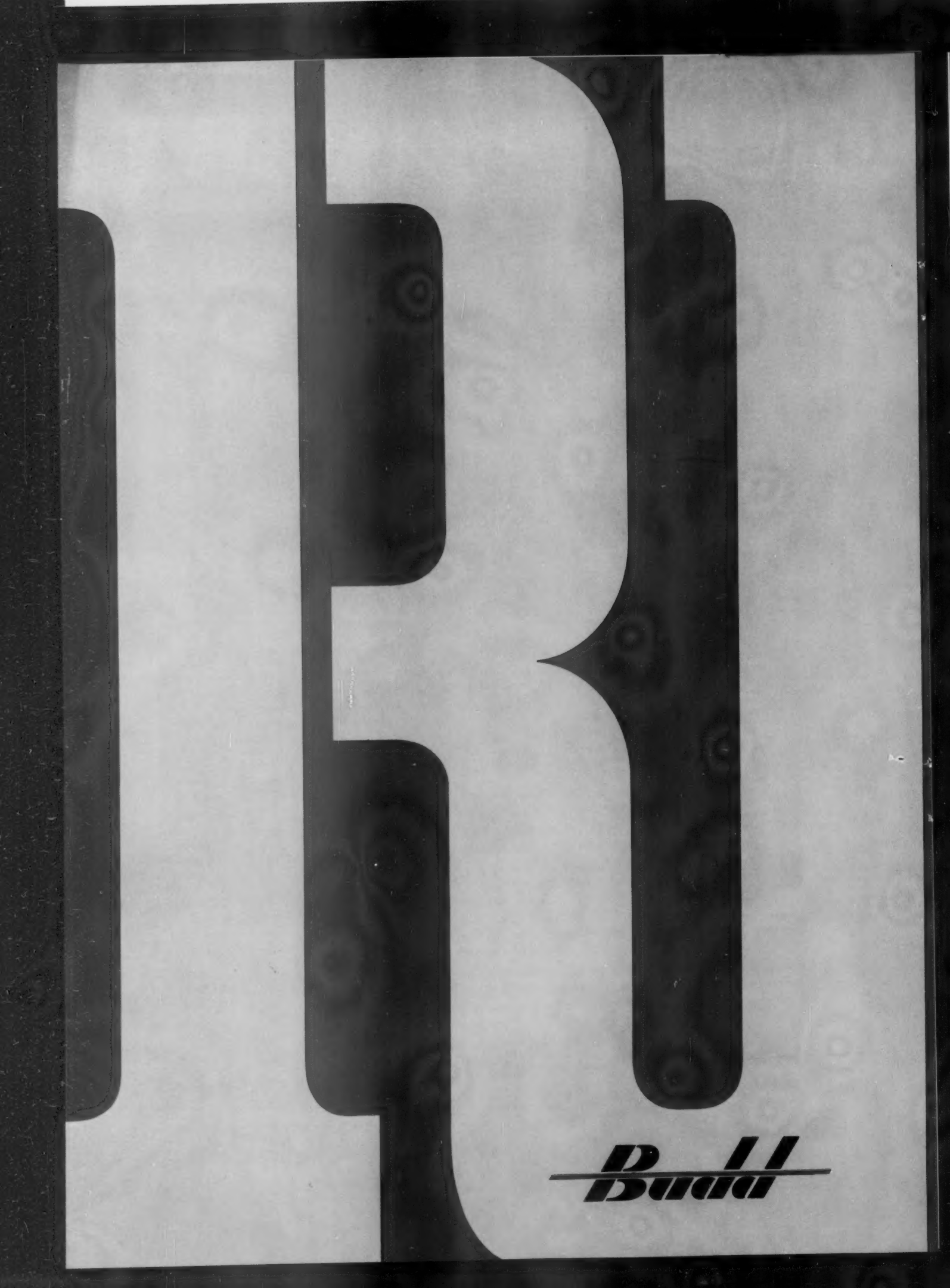
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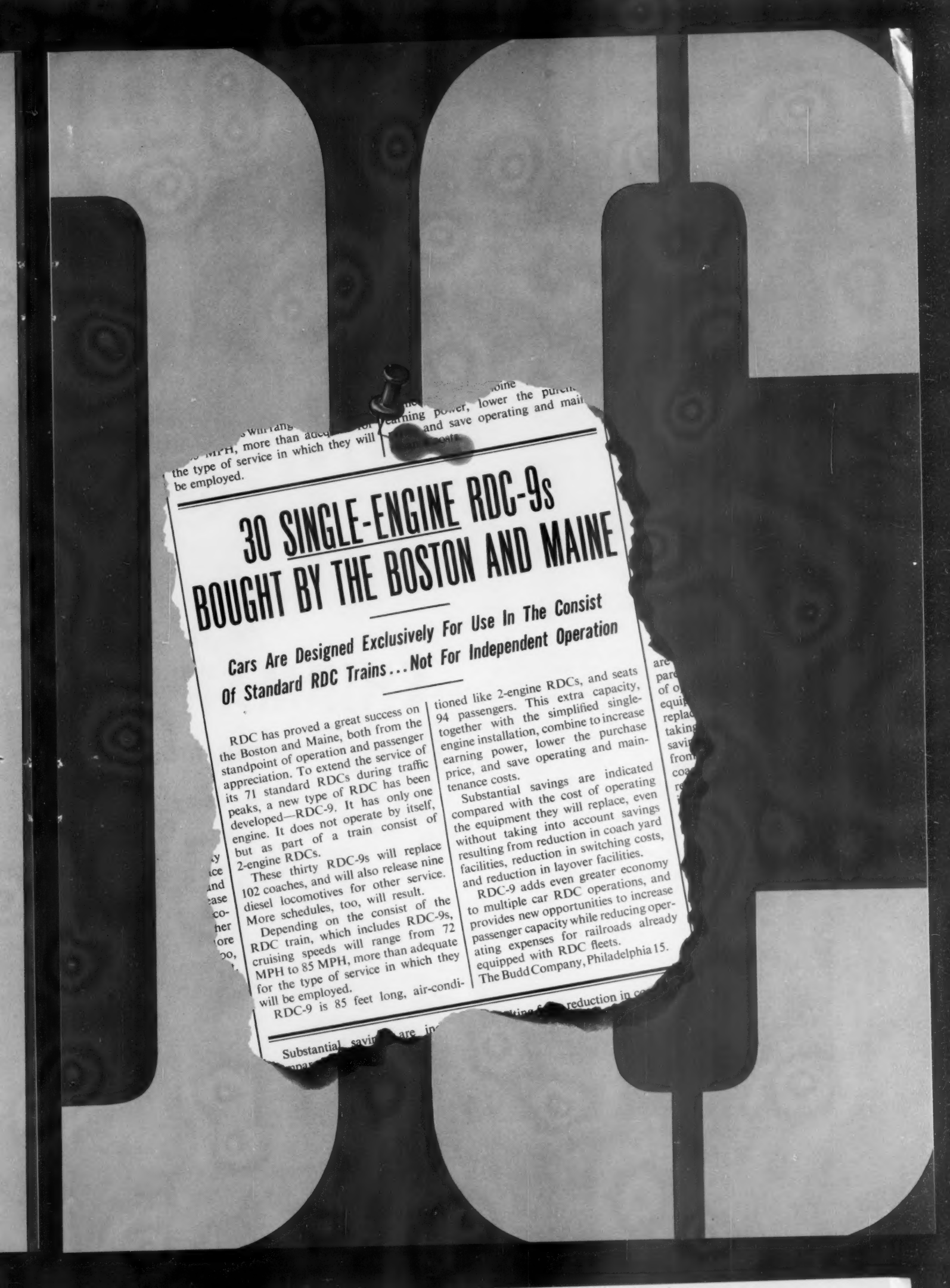


30 SINGLE-ENGINE RDC-9s BOUGHT BY THE BOSTON AND MAINE

Cars Are Designed Exclusively For Use In The Consist Of Standard RDC Trains... Not For Independent Operation

RDC has proved a great success on the Boston and Maine, both from the standpoint of operation and passenger appreciation. To extend the service of its 71 standard RDCs during traffic peaks, a new type of RDC has been developed—RDC-9. It has only one engine. It does not operate by itself, but as part of a train consist of 2-engine RDCs.

These thirty RDC-9s will replace 102 coaches, and will also release nine diesel locomotives for other service. More schedules, too, will result.

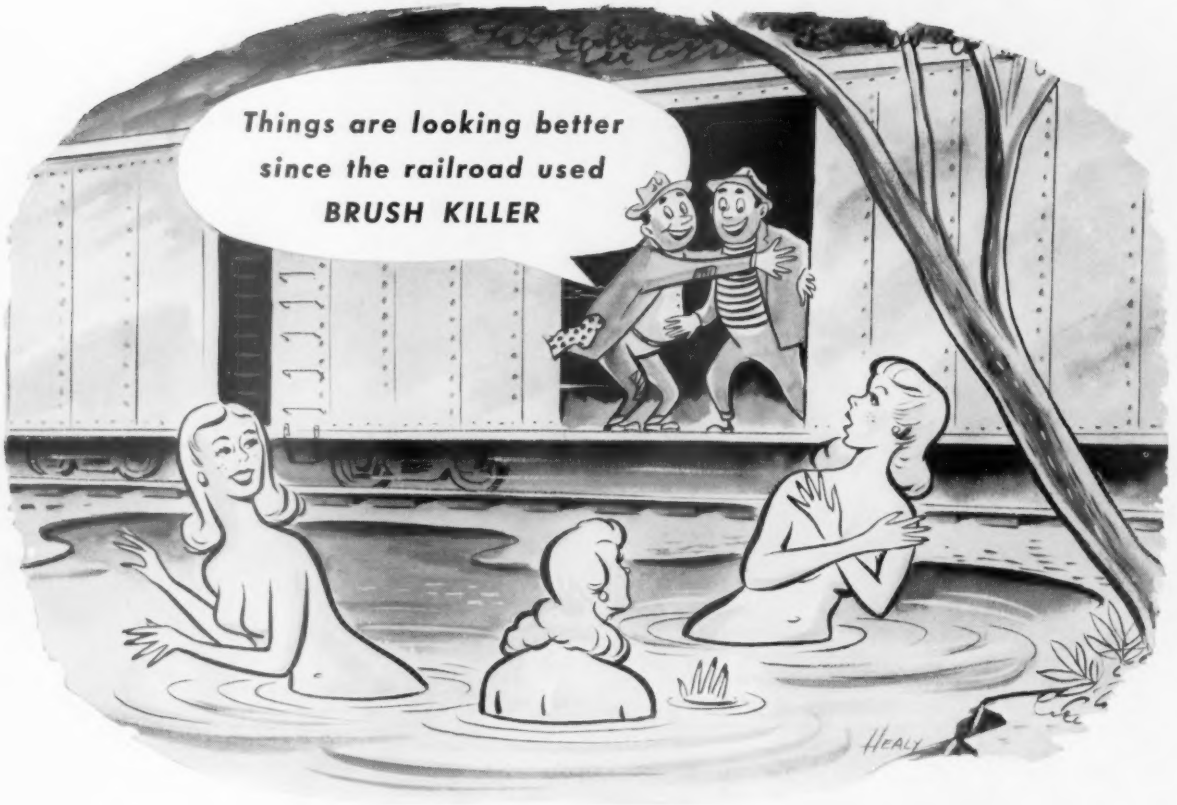
Depending on the consist of the RDC train, which includes RDC-9s, cruising speeds will range from 72 MPH to 85 MPH, more than adequate for the type of service in which they will be employed.

RDC-9 is 85 feet long, air-conditioned like 2-engine RDCs, and seats 94 passengers. This extra capacity, together with the simplified single-engine installation, combine to increase earning power, lower the purchase price, and save operating and maintenance costs.

Substantial savings are indicated compared with the cost of operating the equipment they will replace, even without taking into account savings resulting from reduction in coach yard facilities, reduction in switching costs, and reduction in layover facilities.

RDC-9 adds even greater economy to multiple car RDC operations, and provides new opportunities to increase passenger capacity while reducing operating expenses for railroads already equipped with RDC fleets.

The Budd Company, Philadelphia 15.



Chipman Chemical Company weed killers, brush killers and application service are backed by over 40 years of experience in serving railroads. An extensive line of weed, grass and brush killing chemicals is available to meet varying conditions. Included are the following:

Atlacide	Atlas "A" Arsenical
Chlorax	Atlas "D"
Chlorax "40" • Chlorea	Brush Killer
TCA-Chlorax	Telvar W
Methoxone-Chlorax	Borax • Dalapon

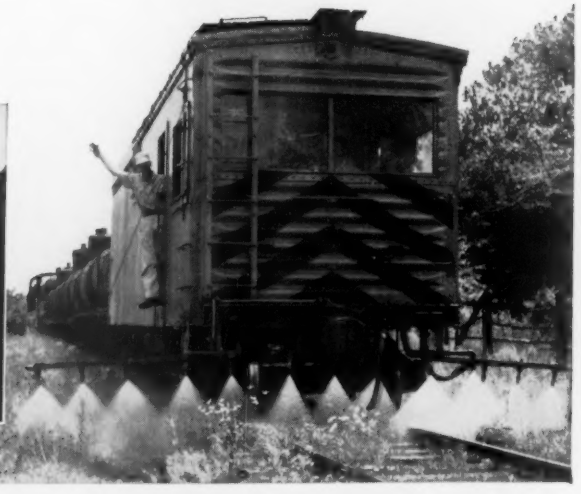
Let us solve *your* weed problems with the *right* chemicals and application service.

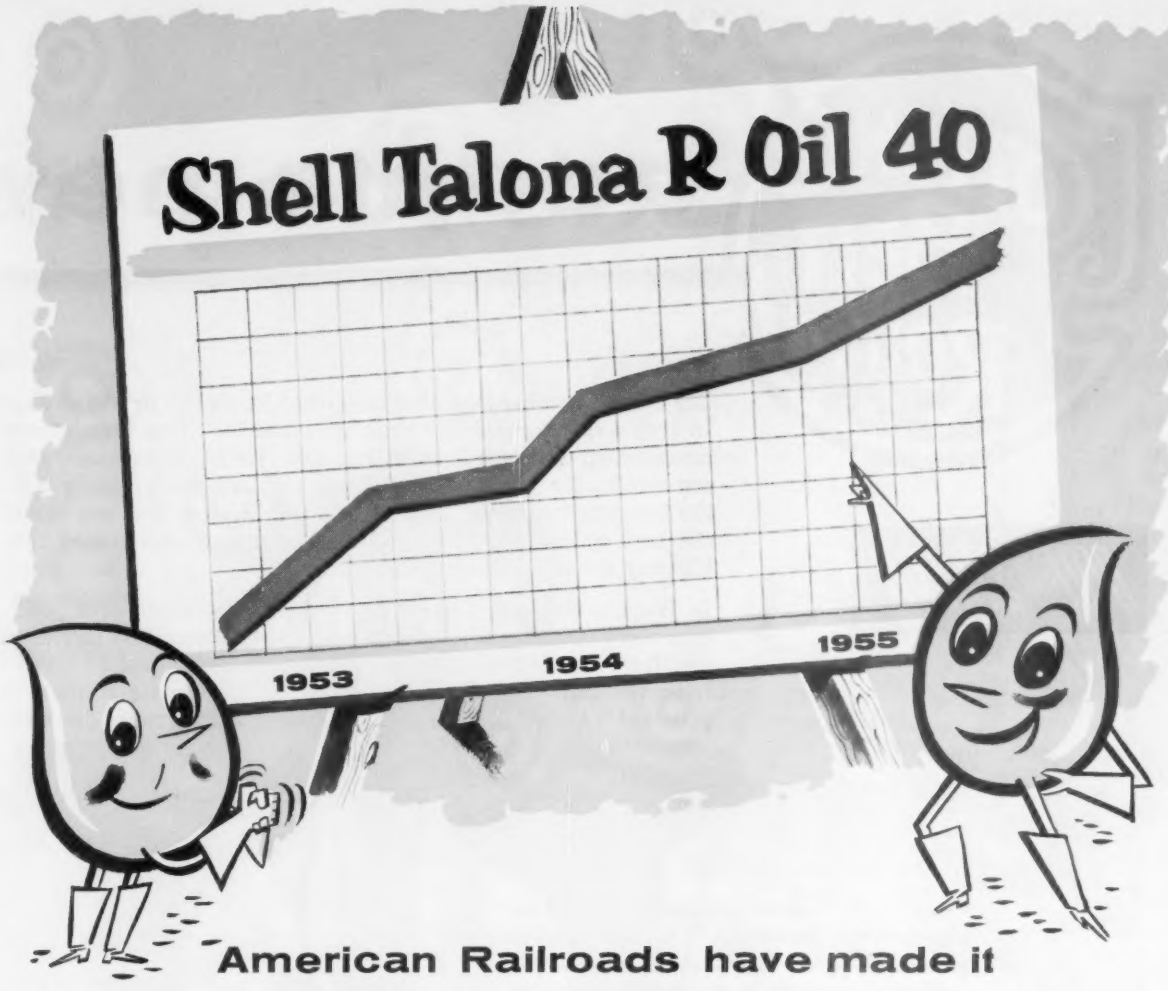
CHIPMAN

Chemical Company, Inc.

Bound Brook, New Jersey

16 Strategically Located Chipman Plants





American Railroads have made it the fastest growing diesel locomotive lubricant in the U. S. A.

The acceptance of Shell Talona R Oil 40 by American railroads has been remarkable. Today, whether judged by number of units or horsepower, this lubricant is outstripping all others in rate of growth.

There is good reason for this: Maximum engine performance can be expected when you use Shell Talona R Oil 40.

Superior anti-wear protection

Greatly reduced wear on pistons, rings and cylinder walls is assured because of the selected combination of additives used in Shell Talona R Oil 40.

Maintains engine performance

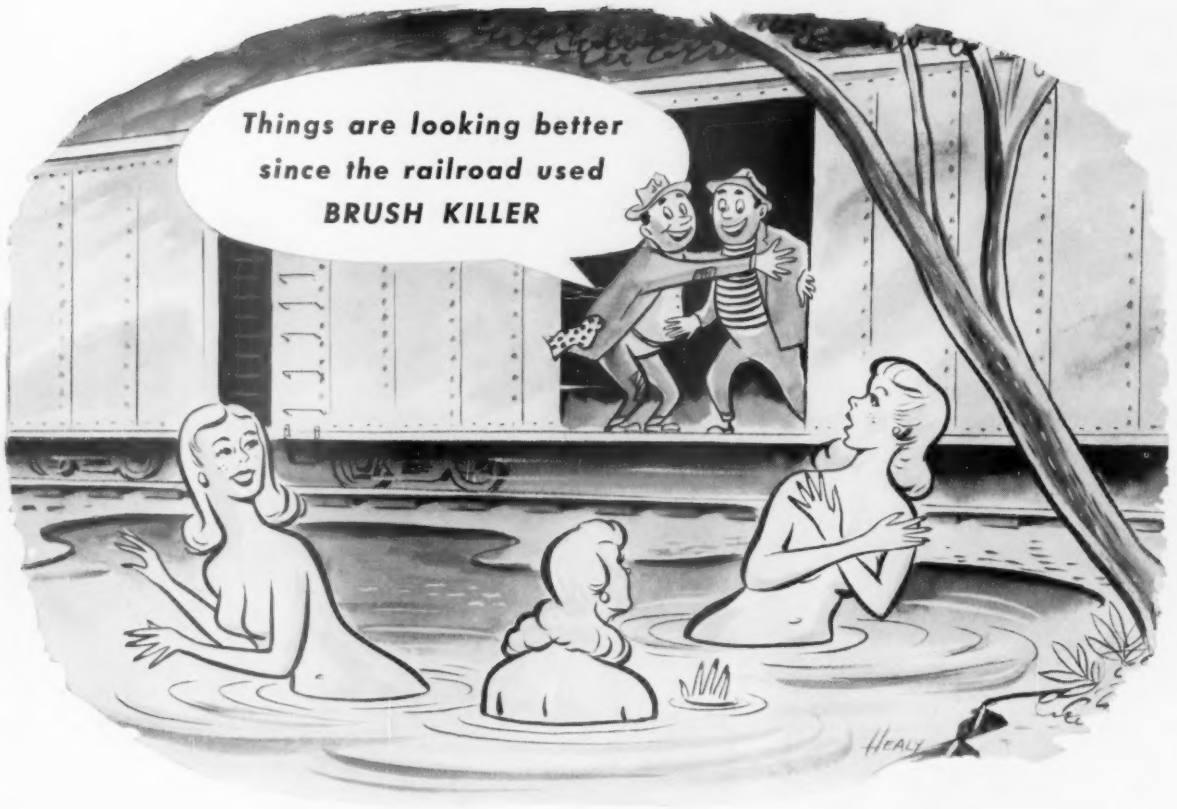
The balanced formula of Shell Talona R Oil 40 combines high oxidation stability and anti-corrosive power. It prevents fouling and has excellent detergent-dispersant action.

For further information write to the Shell Railroad Sales Department.

SHELL OIL COMPANY

50 West 50th Street, New York 20, New York
100 Bush Street, San Francisco 6, California
Shell Building, St. Louis 3, Missouri

SHELL



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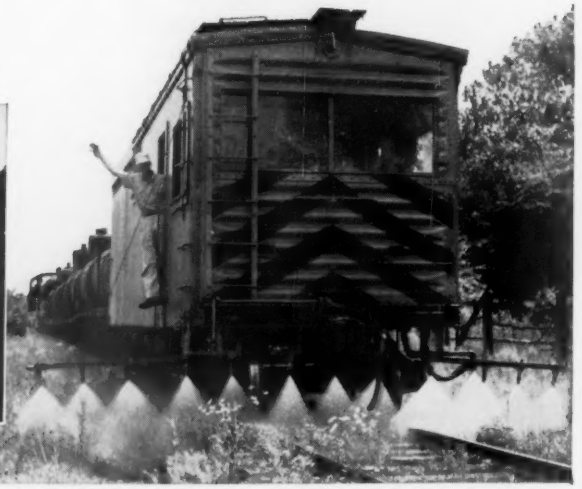

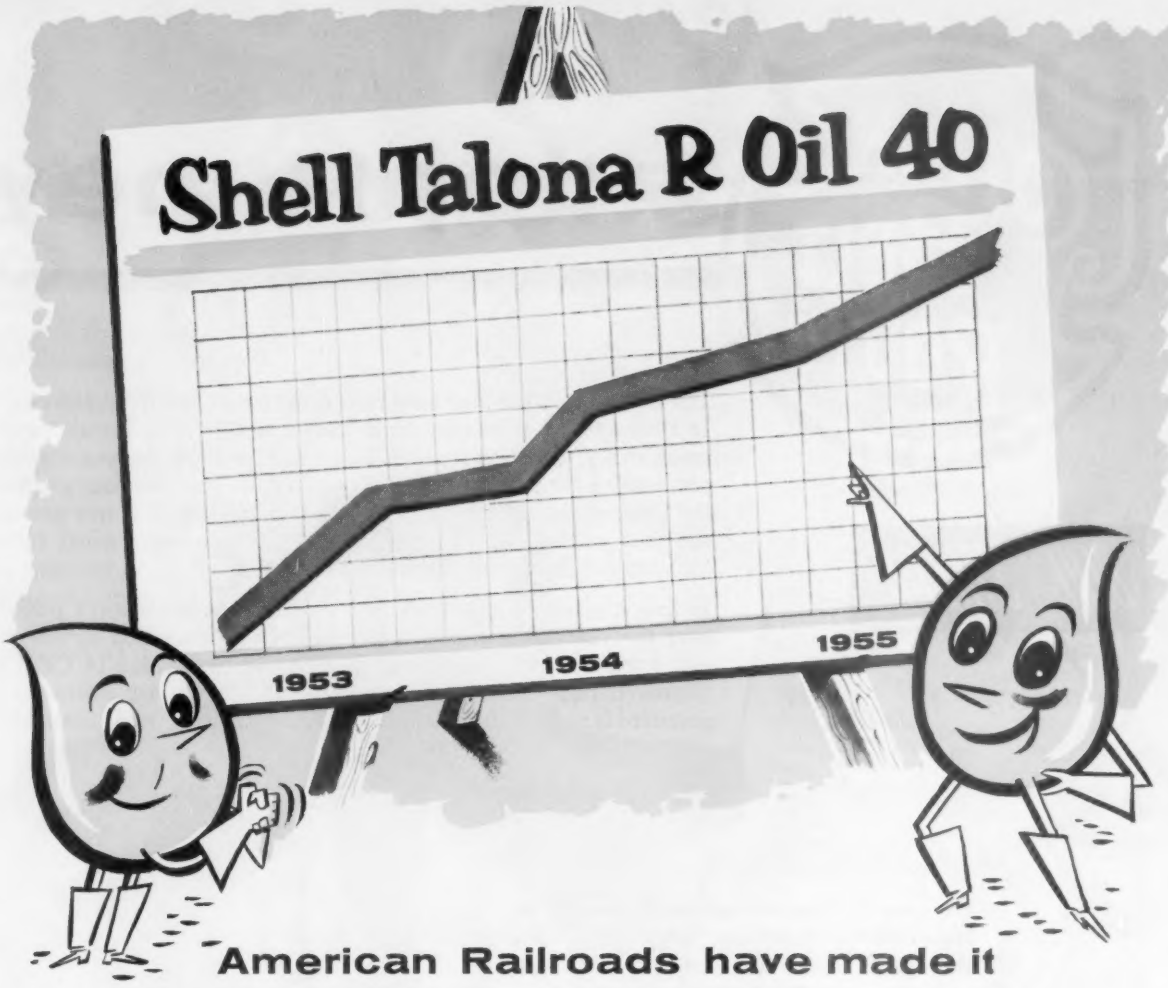

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50 West 50th Street, New York 20, New York
100 Bush Street, San Francisco 6, California
Shell Building, St. Louis 3, Missouri

SHELL

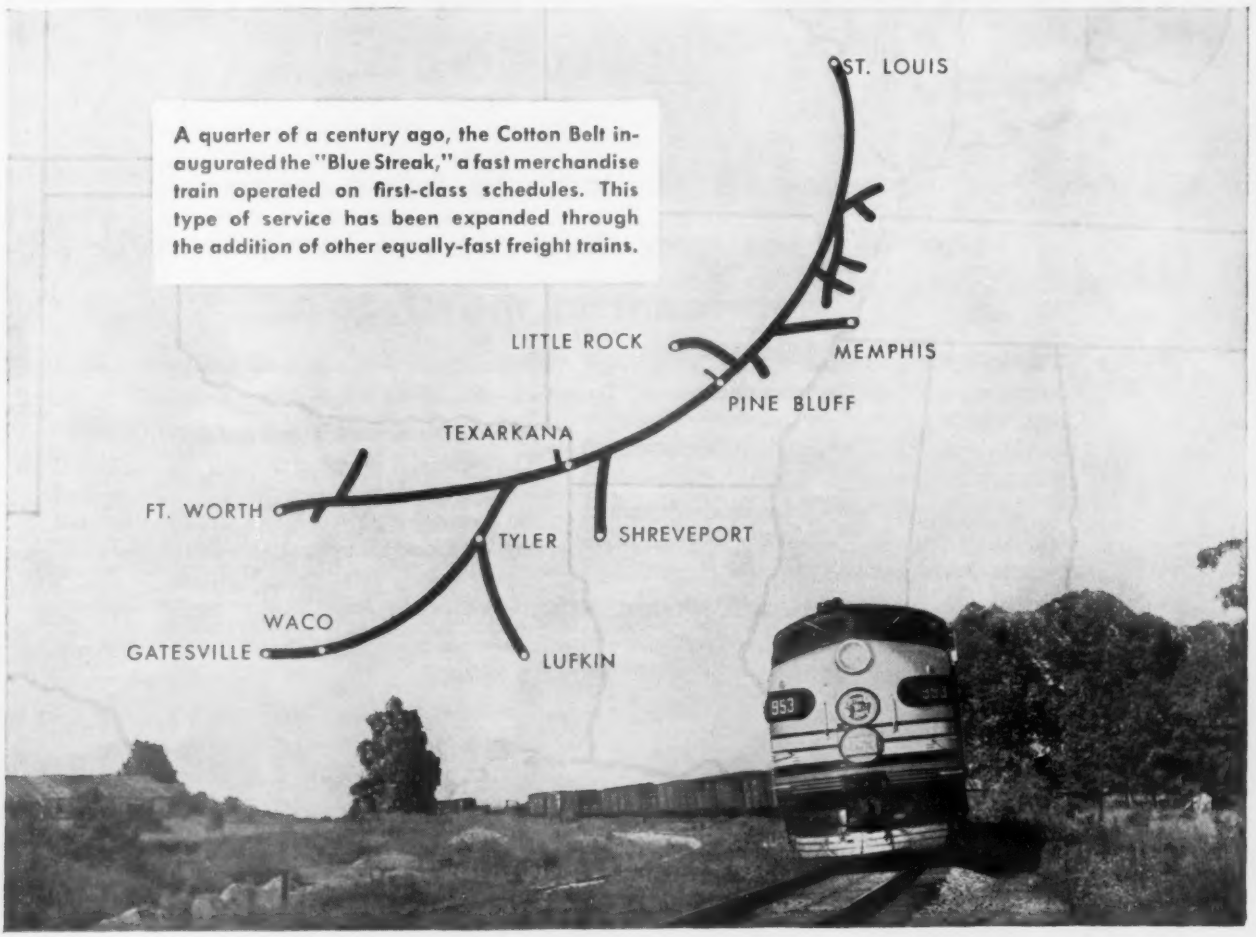
COTTON BELT ROUTE

BLUE STREAK

adopts new

The Cotton Belt has long been recognized for its fast freight service. In 1931 a fast merchandise train known as the "Blue Streak" was inaugurated, operating from St. Louis to Pine Bluff, Arkansas, with connections for Louisiana and Texas points. Simultaneously with the inauguration of the "Blue Streak," the Cotton Belt was one of the first railroads in the country to establish coordinated rail-highway service.

In keeping with the Cotton Belt's permanent progressive policy over the years to provide faster, efficient transportation service to and from the great Southwest, is its early recognition of CF&I's improved rail sections. The adoption of the heavier sections as standard is an expedient to meet the ever-increasing traffic demands.



A quarter of a century ago, the Cotton Belt inaugurated the "Blue Streak," a fast merchandise train operated on first-class schedules. This type of service has been expanded through the addition of other equally-fast freight trains.

rail sections

Rail Joint Company

Toe Joint	115-119F
I-Vertical	30.2
Head Modulus	12.6
I-Lateral	6.5

A.R.E.A. Standard 115# Rail and Joint

I-Vertical	20.6	−47%
Head Modulus	8.5	−48%
I-Lateral	2.0	−225%

Stronger, Stiffer Joints
Better Line and Surface
Economy in Maintenance
Safer, Faster Service

DIFFER FROM RE SECTIONS

There are also points of similarity to existing RE sections. The CF&I 119-lb. section, for instance, is identical with the 115-lb. RE section from the underside of the head down to the base. The result is that all 115-lb. RE track fittings will fit the new 119-lb. section. Likewise, the new 136-lb. section is the same from the head down as the 132-lb. RE sections. This means, of course, that Rail Joint Company 100 per cent headfree joint bars for the 115-lb. and 132-lb. RE sections will fit the new CF&I sections.

Railway Track and Structures, September 1955.

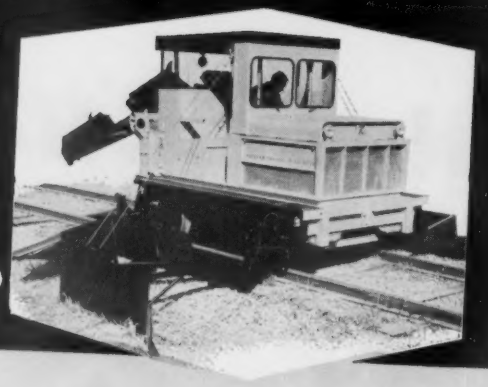
New 119# Rail and Joint Standard, 1956
Assembly shown above approximately 80% of actual size.

CF&I

THE COLORADO FUEL AND IRON CORPORATION

Kershaw
Ballast Regulator

PROVEN...



...on America's Leading Railroads!

~HONOR ROLL~

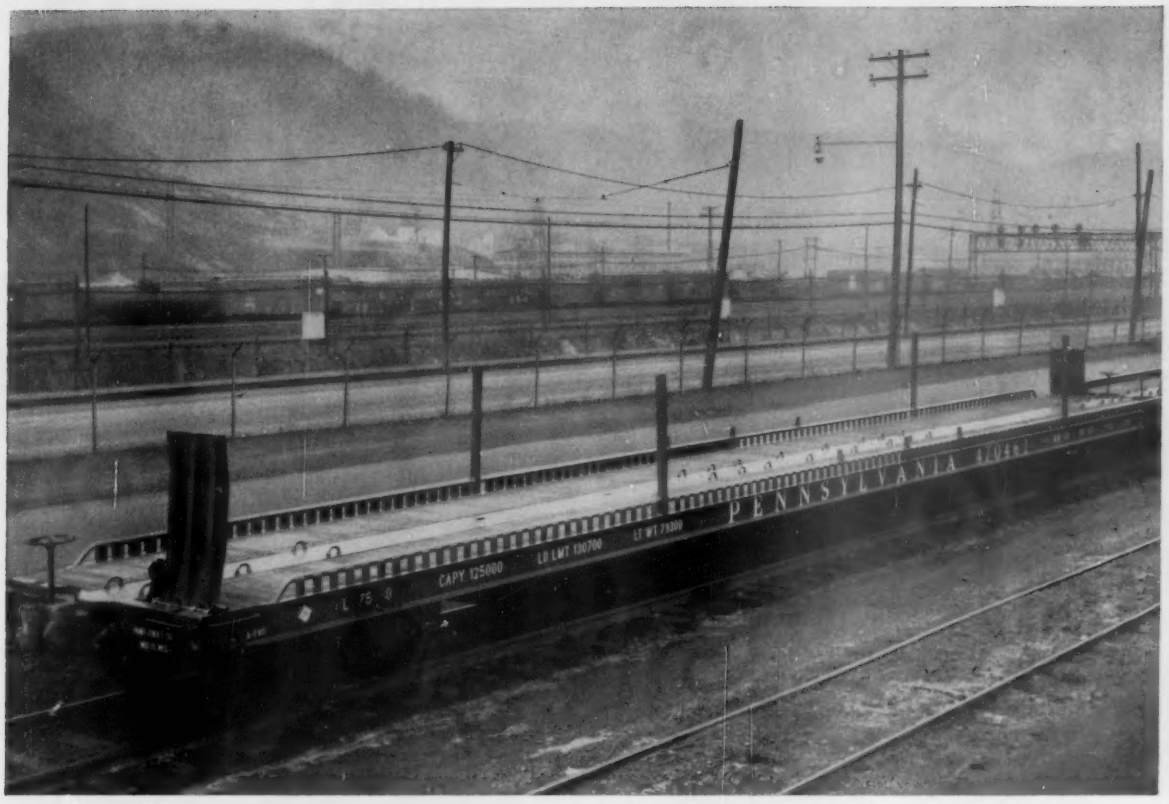
The Kershaw Ballast Regulator, Scarifier and Plow Has Been Purchased by the Following Railroads and Contractors in the Indicated Quantities:

Algoma Central and Hudson Bay Railway Company
Ann Arbor Railroad Company
*Atchison, Topeka and Santa Fe Railway Company
Atlanta & Saint Andrews Bay Railway Company
**Atlantic Coast Line Railroad
***Baltimore and Ohio Railroad Company, The
Bailes and Sey Construction Company
Bessemer and Lake Erie Railroad Company
Birmingham Southern Railroad Company
*Boston and Maine Railroad
*Estrada De Ferro - Central Do Brazil
Rio De Janerio, Brazil
****Canadian National Railways
**Canadian Pacific Railway Company
Carolina and Northwestern Railway Company
**Central of Georgia Railway Company
Central Railroad of New Jersey, The
Charleston and Western Carolina Railway Company
***Chesapeake and Ohio Railway Company, The
*Chicago and Eastern Illinois Railroad Company
*Chicago and Northwestern Railway Company
Chicago Great Western Railway Company
**Chicago, Milwaukee, St. Paul and Pacific Railroad Company
*Chicago, Rock Island and Pacific Railroad Company
Chicago, St. Paul, Minneapolis and Omaha Railway Company
*Clinchfield Railroad Company
Consolidated Railroads of Cuba
*Delaware and Hudson Railroad Corporation
*Delaware, Lackawanna & Western Railroad Company, The
Denver and Rio Grande Western Railroad Company, The
Detroit and Mackinac Railway Company
*Detroit, Toledo and Ironton Railroad Company
Duluth, South Shore and Atlantic Railroad Company
Elgin, Joliet and Eastern Railway Company
Erie Railroad Company
Ferguson & Edmondson Company
Great Northern Railway Company
*Gulf, Mobile and Ohio Railroad Company
Interstate Railroad Company
*Lehigh Valley Railroad Company
Louisiana Midland Railway Company
***Louisville and Nashville Railroad Company
*Mannix Construction Company, Ltd.
Minneapolis and St. Louis Railway Company
*Missouri-Kansas-Texas Lines
*Nashville, Chattanooga & St. Louis Railway, The
*New York, Chicago & St. Louis Railroad Company, The
*New York, New Haven & Hartford Railroad Company, The
*W. H. Nichols, Inc.
***Pennsylvania Railroad, The
Phelps Dodge Corporation
L. E. Pilot and Son Construction Company
*Reading Company
Richmond, Fredericksburg and Potomac Railroad Company
*Royce Kershaw Company, Inc.
***Seaboard Air Lines Railroad Company
**St. Louis - San Francisco Railway Company
St. Louis - Southwestern Railway Company
*T. F. Scholes, Inc., Reading Pa.
*W. A. Smith Contracting Company
*****Southern Railway System
**Southern Pacific Company
*Texas and New Orleans Railroad Company
*Texas and Pacific Railway Company, The
Toledo, Peoria and Western Railroad Company
Union Railroad Company
*United Plastics Limited (Industrial Construction Company)
*Wabash Railroad Company
*Western Maryland Railway Company
Western Pacific Railroad Company
A. S. Wilkstrom, Inc.

*2 to 5 Machines
**6 to 10 Machines
***11 to 20 Machines
****21 to 30 Machines
*****31 to 40 Machines

RECOGNIZE THIS SYMBOL OF LEADERSHIP

KERSHAW MANUFACTURING CO. INC
MONTGOMERY (K) ALABAMA



High strength in these extra-long flat cars, operated by Pennsylvania Railroad, results from using Mayari R, a product of Bethlehem Steel Co., Bethlehem, Pa. A high strength low alloy steel containing nickel, Mayari R permits stronger construction without increasing weight. High speed operation of these cars, as well as lower starting resistance and operating cost are afforded by Timken Roller Bearings. Nickel alloyed steels make the bearing races and rollers extra tough.

Nickel alloy helps new type cars keep strength in... weight down... corrosion out

BUILT TO HAUL two fully loaded highway trailers, these Truc-Train cars must withstand heavy load concentrations in the long span between trucks.

A job of this sort is made to order for Mayari R, a high strength low alloy steel containing nickel.

Steels of this type allow car builders to strengthen rolling stock while reducing bulk and deadweight, because thin light sections provide the same strength and durability as thicker, heavier sections of plain carbon structural steel.

In addition, the high strength nickel steels often save time and cost per unit by their ready response to fabrication, including welding and cold forming.

Especially important, they offer 4 to 6 times greater resistance to atmospheric corrosion than does the usual structural steel. As a result, high strength low alloy nickel steels retain much of their original strength over years of use.

This... plus their resistance to impact, battering and abrasion . . . greatly lengthens car life and minimizes maintenance.

High strength low alloy steels containing nickel along with other alloying elements are produced under a variety of trade names by leading steel companies.

Get the facts

Send for a copy of "Nickel-Copper High Strength Low Alloy Steels." Cover to cover, this illustrated booklet is full of helpful information and data. See why nickel steels cut deadweight, add payload capacity, and step up ton-mile revenue. Write for your copy now.

INCO TRADE MARK **THE INTERNATIONAL NICKEL COMPANY, INC.** 67 Wall Street New York 5, N. Y.

Lubrication—the only maintenance cost of these high-pressure Crane valves

THE CASE HISTORY—When an oil can is all you need to keep high pressure valves at peak efficiency year after year, you know your valve investment is a wise one.

That's how Philadelphia Electric Company feels about the Crane Pressure-Seal Bonnet Gate Valves at its Delaware Station—one of this utility's newest units, started up early in 1953.

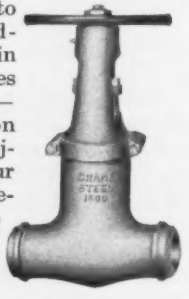
The Crane valves, operating on boiler feed service at 2000 psi, 500° F., have demonstrated completely their maintenance-saving values.

The old practice of re-stressing bonnet bolts doesn't apply to these valves. Yet the body-bonnet joint remains completely tight. Never a leak; never a need for a wrench. Crane Pressure-Seal design, utilizing internal fluid pressure, maintains a positively leakproof metal-to-metal joint inside the body.

The seats and stuffing box on all valves remain equally tight. Operation is smooth, nonsticking. The Crane flexible wedge disc prevents binding under contraction.

Other value features of Crane Pressure-Seal design are compactness . . . weight saving with no loss of strength . . . and clean exterior lines that simplify insulation.

Power plants around the world report new performance records for Crane Pressure-Seal Bonnet Valves. Now's the time to consider this advanced design—in gates, globes, angles and stop-checks—for modernization or extension projects. Contact your local Crane Representative or write to address below.

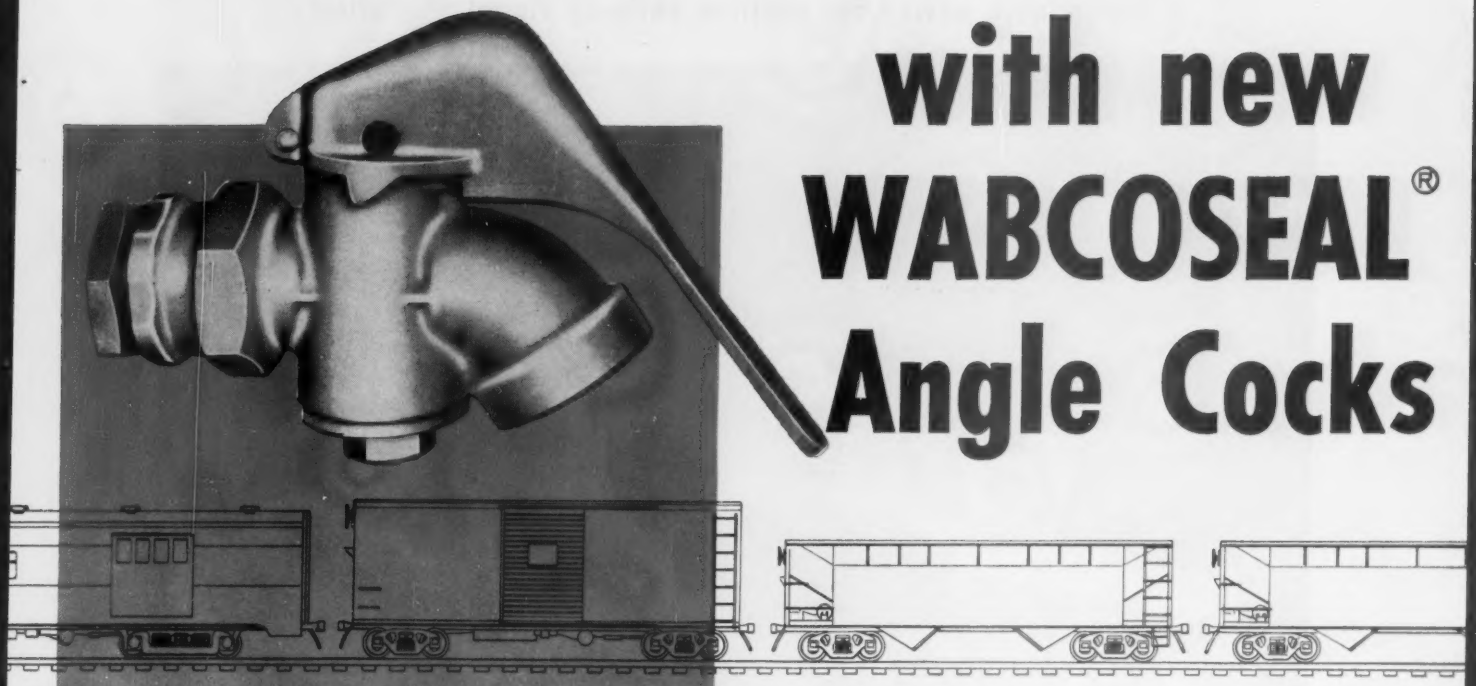


CRANE VALVES & FITTINGS

PIPE • KITCHENS • PLUMBING • HEATING

Since 1855—Crane Co., General Offices: Chicago 5, Ill. Branches and Wholesalers Serving All Areas

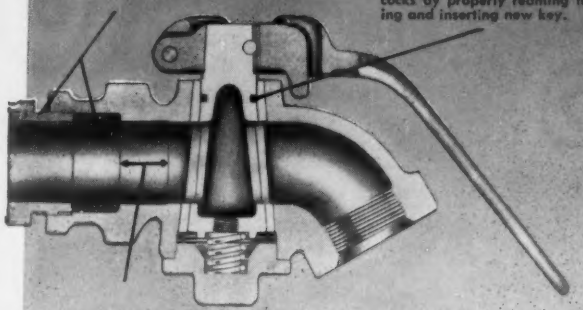
Stop those air leaks with new WABCOSEAL® Angle Cocks



FOR FREIGHT CARS:

Wabco compression ring grips pipe when nut is tightened to provide tight seal and strong clamping action.

"O" ring seals the key effectively through a wide degree of key wear. This seal can be used on old angle cocks by properly reaming the bushing and inserting new key.



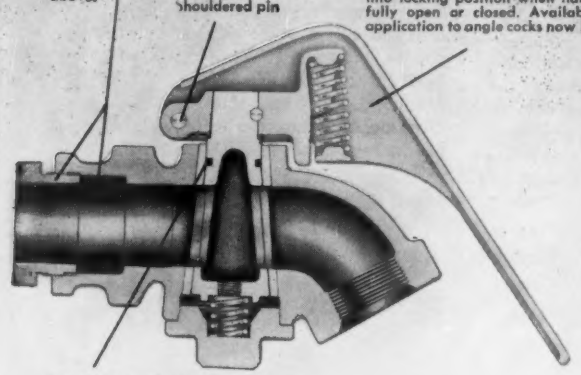
Brake pipe nipple length can fall anywhere within this range and still be perfectly sealed. Threaded nipple is not necessary but can be used if more convenient.

FOR PASSENGER CARS AND LOCOMOTIVES:

New Wabcoseal fitting is same as for freight car angle cock shown above.

Shouldered pin

Strong spring is compressed when handle is raised. Socket is snapped into locking position when handle is fully open or closed. Available for application to angle cocks now in use.



Sealed key is identical to freight car angle cock key shown above.

DON'T tolerate a high air leakage rate on your trains. Use the new Wabcoseal Angle Cocks for tighter seals.

The sealed key is new, with an "O" ring seal that stays tight through a wide range of key wear.

The brake pipe connection is new. A rugged Wabco compression ring replaces the old tapped thread. Tolerance for length of pipe nipple is now provided.

The spring-locking handle is new for passenger cars and locomotives. When the handle is removed to fully open or closed position a strong spring snaps the socket into locked position and keeps it there. A shouldered pin provides proper freedom of handle movement.

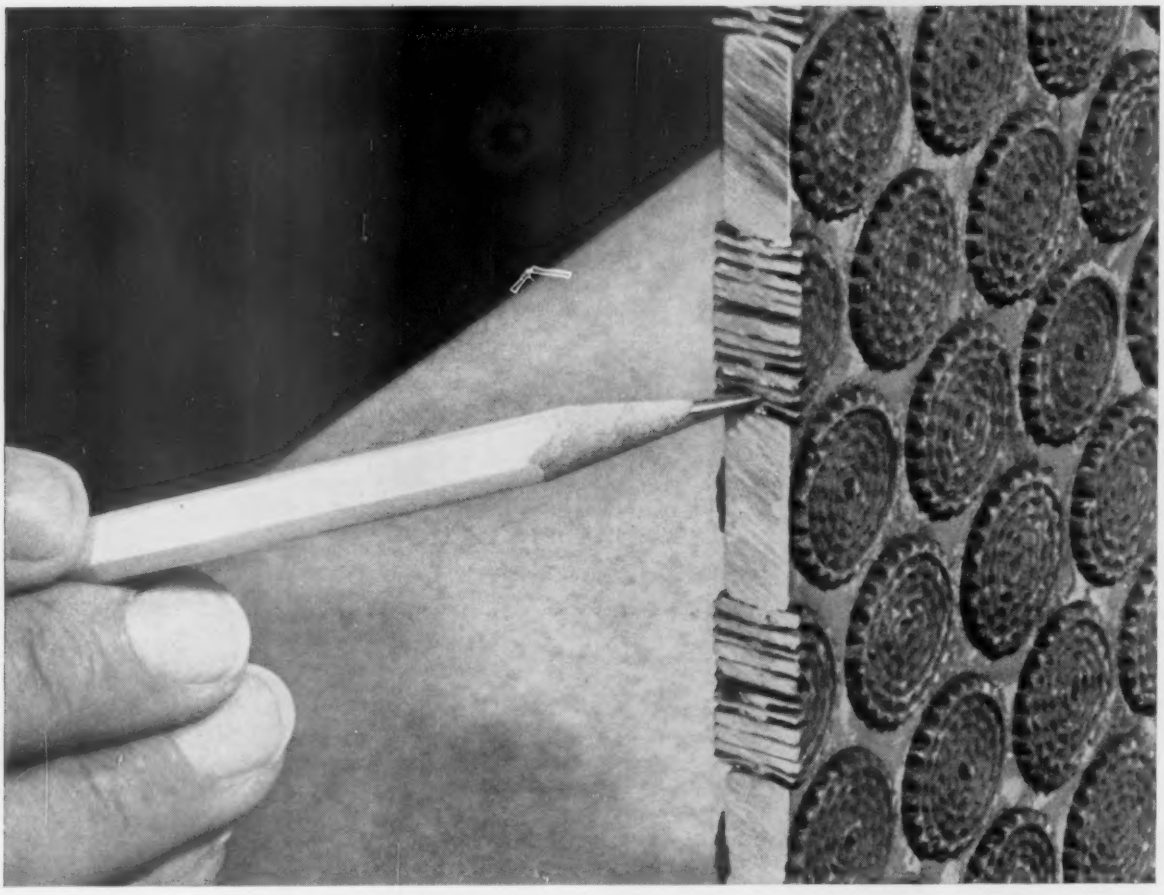
The sealed key and spring-locking handle are available for application to present angle cocks. See your Westinghouse Air Brake representative for more information.

Westinghouse Air Brake
COMPANY

AIR BRAKE DIVISION WILMERDING, PA.

EXIDE-MANCHEX BATTERIES

Dependable power for positive railway signal operation



Spiral buttons act like shelves for oxide—prolong battery life

RAILWAY SIGNALING BATTERY. Exide-Manchex Batteries are available in a wide range of capacities from 8 to 960 ampere hours. Compact construction saves space and weight. Flat cover easy to clean. Write for Bulletin No. 5307.

In ordinary batteries, the active material clings to the vertical surfaces of the positive plate—forever fighting the forces of gravity and turbulence. Let it loosen its grip and down it comes. And there goes battery life.

Not so with Exide-Manchex Batteries. Active material is built up between the spiral layers of these unique lead buttons that act like tiny shelves. There it rests, supported against gravity and electrolyte turbulence. And there it stays for years and years and years.

This simple design principle is one of the several tangible reasons for the long, useful life of Exide-Manchex Batteries. Used in a wide variety of floating service applications, these batteries have earned a reputation for long, dependable service unsurpassed in the entire world. And this method of construction is available only in Exide-Manchex Batteries.

When you order batteries for applications where you need dependable performance and long, useful life, or when you buy equipment using this kind of battery, be sure to specify Exide-Manchex Batteries. Exide Industrial Division, The Electric Storage Battery Company, Philadelphia 2, Pennsylvania.

Exide®

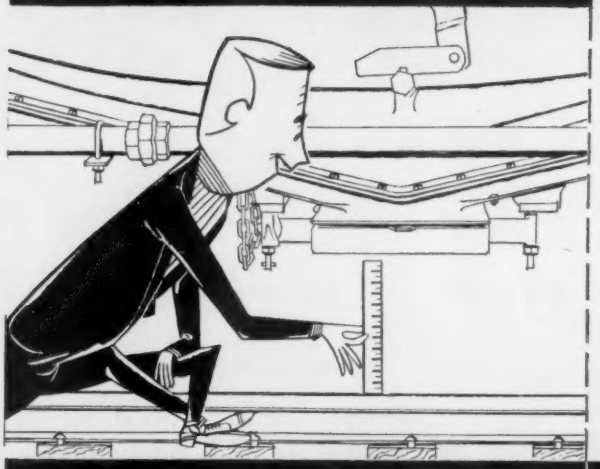
No bills for bags, drums, containers

Easier, safer loading and unloading

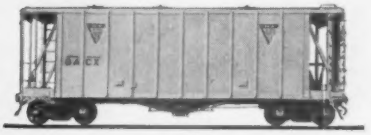
No sanitation problems in transit

No packing, racking or stacking

Far more clearance for unloading



Bulk shipping of dry, granular and powdered products in General American Airslide® Cars is safer, easier—and costs less!



Over 2000 Airslide Cars now in service or on order. A small blower is all you need to unload cars into any conveying system. Write for bulk shipping information on your products.

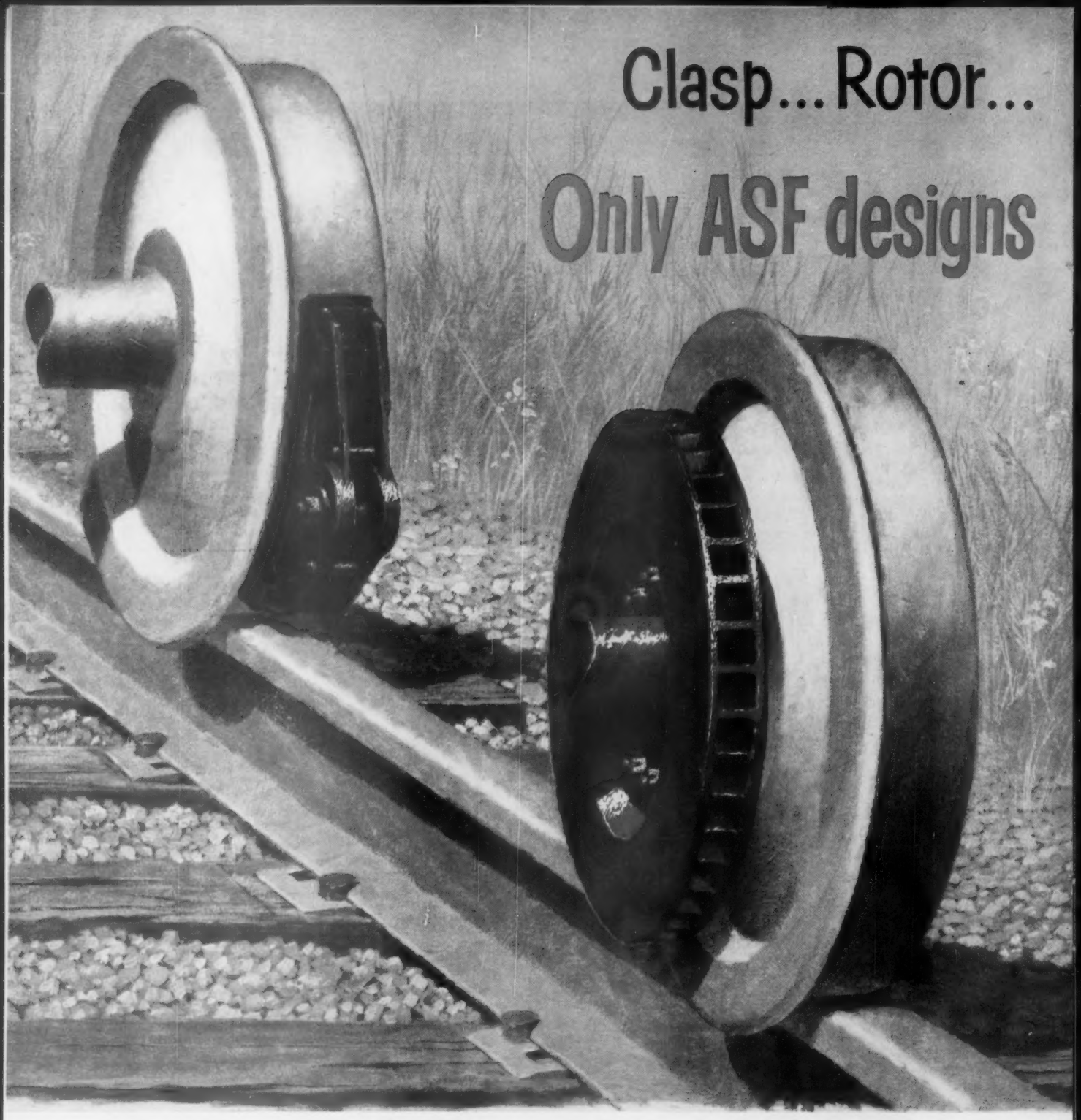
AIRSLIDE GENERAL AMERICAN TRADE MARK

GENERAL AMERICAN TRANSPORTATION CORPORATION
135 South La Salle Street, Chicago 90, Illinois

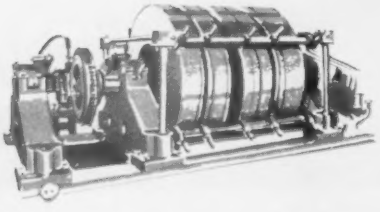
AIRSLIDE CARS—now successfully shipping flour, semolina, sugar, starch, plastics, chemicals and other products.

Clasp... Rotor...

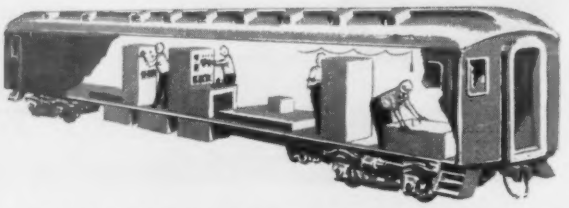
Only ASF designs



ONLY ASF IS EQUIPPED TO DEVELOP AND BUILD ALL THREE



ASF Brake Test Dynamometer permits close-range laboratory study of braking action . . . This unique machine can duplicate the stresses and kinetic energy of stops from 150 mph on down—service or emergency—as well as low or high speed drags.



ASF Brake Test Car furnishes final, on-line proof of brake design and brake performance . . . Over 1800 brakeway stops have been made to date with this ASF car—fitted at various times with ASF clasp, rotor and combination brakes.

or Combination

and builds all three types of brakes

Railroad men may well ask why only one company—American Steel Foundries—is prepared to build any type of brake.

The answer is *experience.* Not just the experience of *building* brakes for 35 years, but the kind that comes from being the only company equipped to do a thorough, objective job of *brake development.* The Brake Dynamometer and the ASF Brake Test Car, shown on the opposite page, are typical of the specialized equipment it takes to do that job.

But it takes more than specialized equipment. It takes men with the skill to design such equipment, with the technical background to use it properly, with the experience to interpret research data in practical terms. There's no easy way to design and develop many different types of brakes; no substitute for testing each brake under conditions that are identical with on-line train operation.

Ask your ASF Representative to show you the results of these on-line tests. That's the sure way to find the type of brake with the characteristics *you* want. Only at ASF can you *choose* the brake that's right for your road.

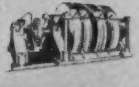
ASF

AMERICAN STEEL FOUNDRIES

Prudential Plaza, Chicago 1, Illinois

Canadian Sales: International Equipment Co., Ltd., Montreal, Quebec

Look for the MINT ◯ MARK of fine products

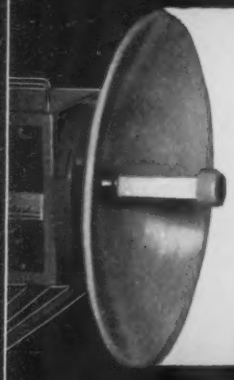


Developed by Research
Special ASF-built machinery brings on-line brake problems into the laboratory for close-range study.

Tested On-Line . . .
The completely equipped ASF Test Car serves as a "proving ground" for new developments in brakes.

Proved In Service . . .
Far more passenger cars are equipped with ASF-built brakes than with all other makes combined!

For Greatest Reliability over



it's PHILCO POWER

10 times more microwave power gives

EXCLUSIVE WITH PHILCO! Ten times more transmitter power in Philco CLR-7 Microwave systems . . . with a degree of performance and reliability never before attained in microwave equipments.

Heart of the Philco system, the "Power House" Klystron, generates a full watt of power (10,000 watts ERP) in the preferred 6000-7500 mc band.

This Philco CLR-7 Microwave power results in a received signal 10 times stronger—a higher safety margin to overcome adverse propagation conditions.

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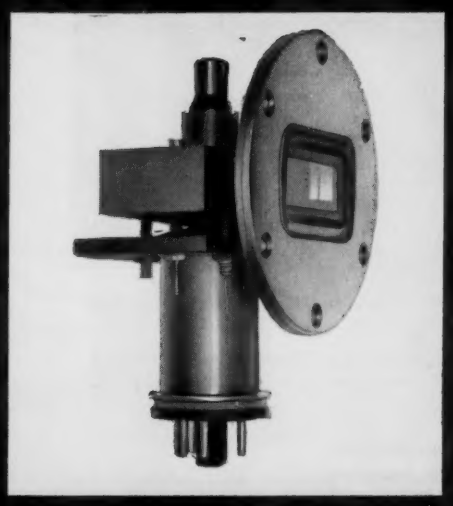

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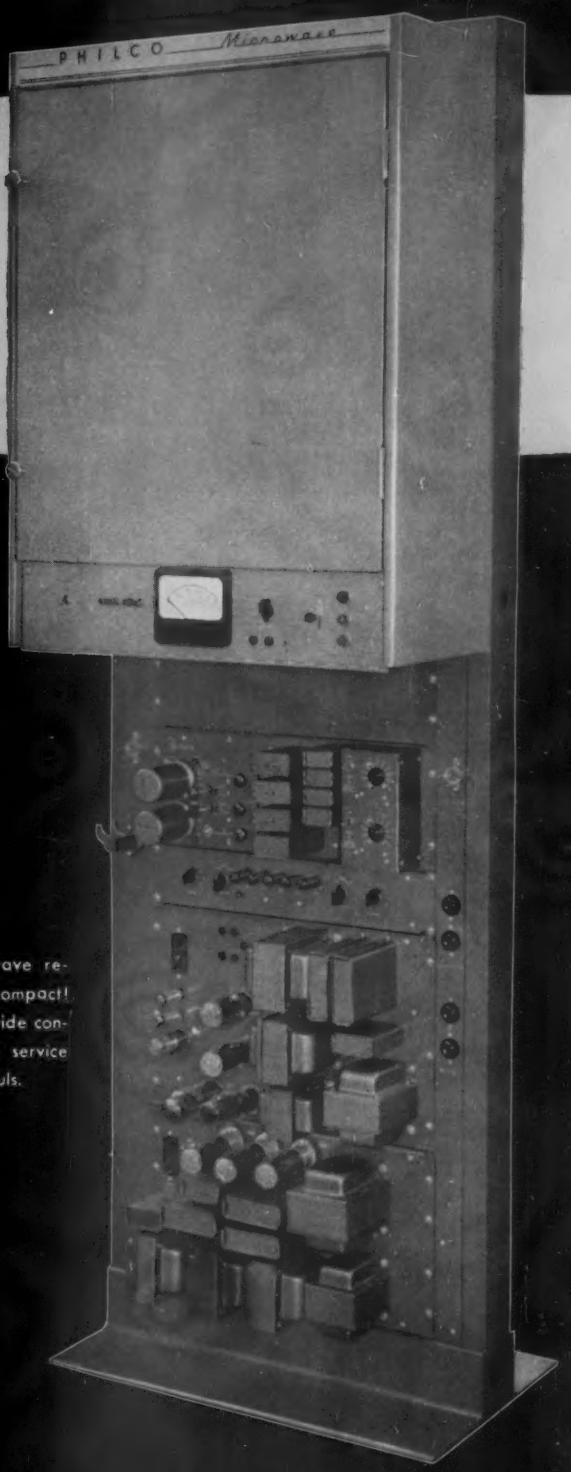

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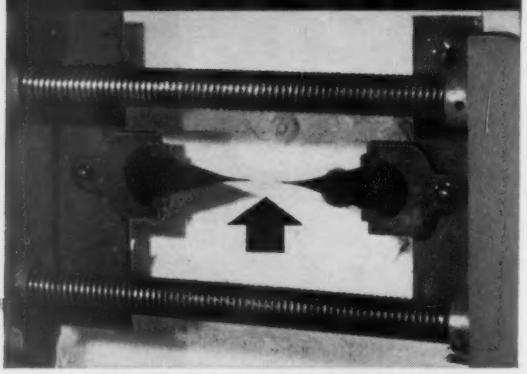

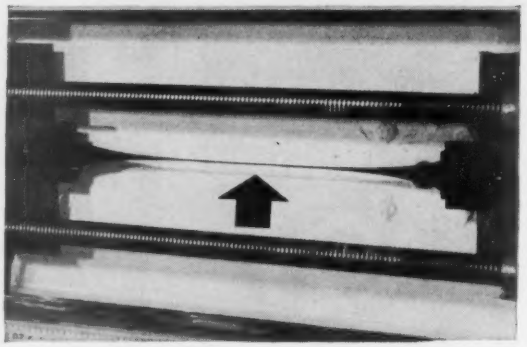

Top: a typical asphalt shown at average breaking point of 12 CM.

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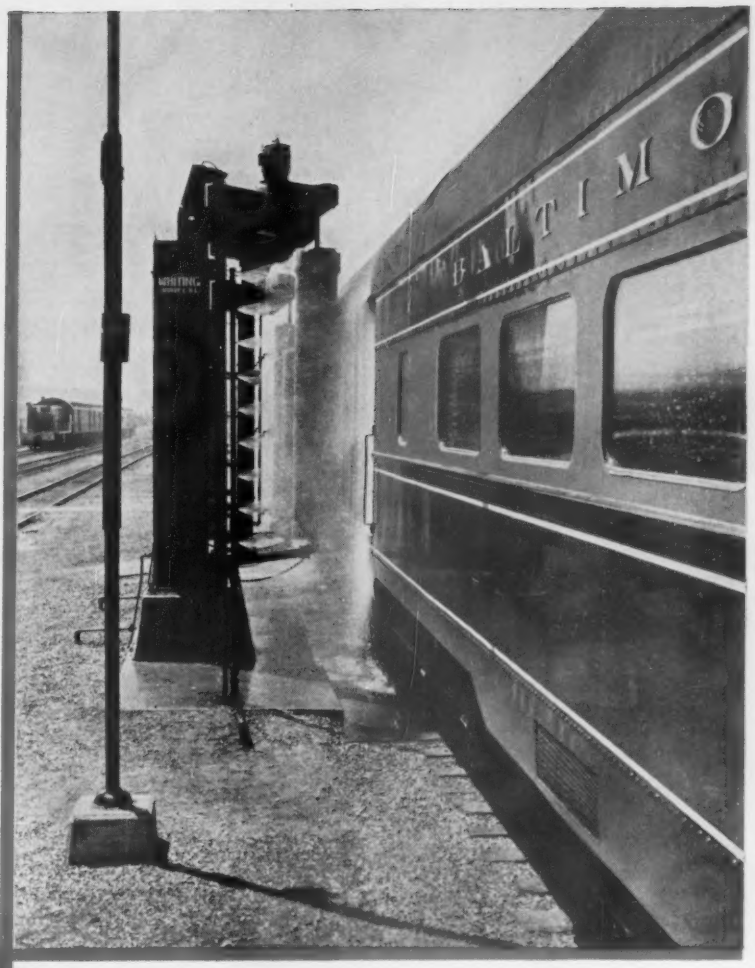

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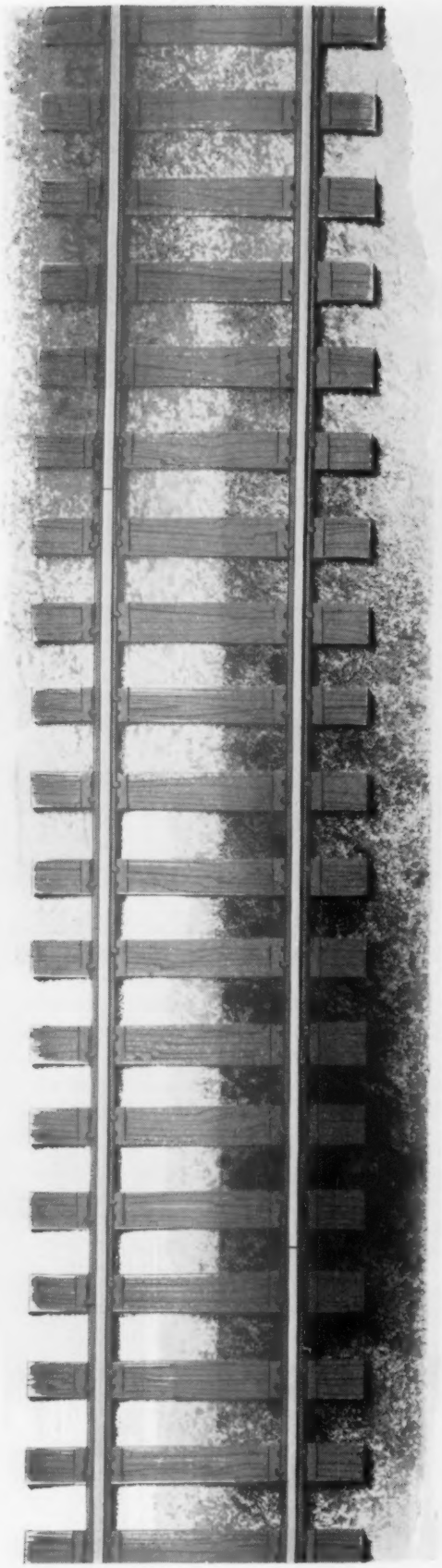

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The Weeks Report in Refrigerator Language

It is quite an assignment to arouse the enthusiasm of people for reducing regulation of railroads —when most of them don't even know the railroads *are* regulated; and don't much care whether they are or not. The situation is a lot like that of the fellow who wrote a book about elephants, containing more information about them than anybody wanted to know.

The most promising approach to a problem like this usually is to try to liken the situation to one which is familiar, and hence more interesting to most people. Most people know more about the competition of different kinds of domestic refrigerators than they do about transportation competition. So, one of the most active and most successful interpreters of the "Cabinet Report" to popular audiences tells his story in "refrigerator language," somewhat as follows:

"Let's assume that you make and sell gas refrigerators and I make and sell electric refrigerators. Each of us has an excellent product. Your box does a better job in some areas, such as remote country districts where electric power is not always available. Mine does an excellent job in cities and wherever power is conveniently accessible. We compete evenly, price-wise, throughout our entire marketing territory, except in *this city* where last year my price was $10 under yours for the equivalent competing box.

"So early in January you went to your sharp-pencil boys and said: 'We got kind of a rough going-over here in the city last year. Let's see if we can't be more competitive. Can't we reduce the price of our box here?'

"And your boys came back and said: 'We can reduce the price $25 a unit in this city and still make money on each sale. And, in our opinion, we'll make more money overall by selling more refrigerators.' The new price would thus still be fully compensatory.

"But let's assume that there is a Federal Refrigerator Commission in Washington and that, in order for you to make that reduction, you have to file your new price down there. Of course I hear about it. So what do I do? I go to Washington and complain and ask the commission to please suspend your proposed reduced price on the ground that, if you are allowed to put it into effect, it will have an adverse effect on my business and give you more than a 'fair share' of the refrigerator business.

"To keep the comparison accurate with conditions in transportation, we must assume that the law under which the Refrigerator Commission operates gives it seven months to consider such an application. So the commission suspends your proposed price and takes the full seven months to consider the merits of the case. They begin their deliberations on the first of March and they hold the case through March and all the months through September. And then on the first of October they come up with their decision.

"That decision *could* go either one of two ways. It could be that your proposed new price is perfectly legal and you may put it into effect. In that case you say: 'Sure, that's fine. But what good does it do me for the commission to tell me *now*, on the first of October, that I can put this reduction into effect? The selling season is over.'

"Or maybe the commission comes up with the other answer after seven months of deliberation. Maybe it says: 'No, you can't put that reduction into effect because it would have an adverse affect upon the business of your competitor. The fact that your proposed price would be profitable to you doesn't make any difference. We still say it is unlawful.'

"In either case, the gas refrigerator people have lost out, either for one season or permanently; and in either case the consuming public has lost out by having to pay a higher price for refrigerators than it should have. The government has prevented free competition.

"That's not the usual American way. That isn't the way most of the great industries of this country have been allowed to grow. Yet that is exactly what is going on in transportation. The Cabinet Committee Report says this situation should be corrected. It is unfair to the low-cost producers of transportation who want to compete for business, and it is unfair to the consuming public."

The reception that story is getting shows that audiences understand what the speaker is telling them, and most of them agree with him. The law as it now stands probably isn't going to be changed until tens and hundreds of thousands of people are led to understand what is going on; and they probably won't ever know about it as long as the story is told in customary regulatory language, which is no more comprehensible than Greek to most people.

AT A 6-in. unbalanced elevation the static lean inward of the dome car at the eaves was 6.6 in. versus 9.6 in. for the standard car. The measurement at the side sill shown here gave the car body angle.

UNION PACIFIC TESTS—

How Dome Cars Act in Curves

- Compare roll with standard cars
- Establish passing train clearances
- Evaluate newer truck features

By D. S. NEUHART and W. C. KRAUTHEIM

To find out how a dome car can be expected to behave in curves, the Union Pacific ran a series of tests on different curves at different speeds using a special train containing both dome and regular cars. In this way the engineers could compare the behavior of the dome car with that of the conventional car as they determined the lean and roll to establish clearance and speed allowances.

The test served also to determine the effect of the newer General Steel Castings four-wheel truck with outside swing hangers and central bearing on stabilizing the ride on curves. It likewise indicated how this truck compares with the inside swing-hanger truck commonly used under streamline cars until a few years ago.

A report of these tests discloses that the dome car, despite its higher center of gravity and longer travel bolster springs, has:

1. Approximately half the angle of roll of the regular car.
2. Two-thirds as much lean inward standing on track with 6-in. superelevation.
3. A little over half the lean outward when taking a curve at high speed.

The cars compared are a lightweight sleeper built in 1941 and one of the latest dome coaches delivered to the UP (Railway Age, Apr. 11, 1955). Two types of tests were made —static by elevating the wheels at the shops, and dynamic by running through curves at various speeds.

The Static Tests

Purposes of the static tests were to establish basic data and to see how much a standing car would lean to the inside of different curves. The latter figure determines the minimum clearance condition, which occurs when a standing car on the outside track of a curve is passed by a train at maximum speed on the inside track. The static tests also measured the horizontal displacements from eave to skirt point to the center line of track, these being determined for 2, 4 and 6 in. of track elevation.

For the dynamic tests a six-car train—comprising a diesel locomotive, buffer cars, the two test cars and a business car—made a round trip from Omaha to Ogden. To facilitate observations the train was operated only in daylight.

The car body angle with respect to the vertical was measured by gyroscopes, the lateral displacements between the truck frame and bolster at each end of the test car by electric strain gages. The test train was arranged with speedometers and a push button switch to operate at mileposts to produce coded marker indications on all recorders.

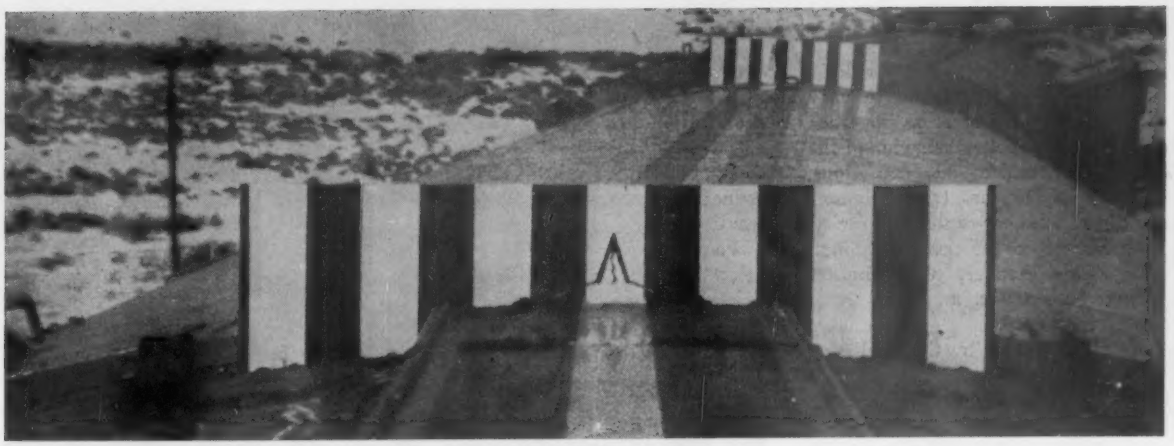
Records were made through 52 curves selected by the district engineer, at speeds varying so that as much as 6 in. of additional elevation (6 in. unbalance) would have been required on the outer rail to obtain equilibrium. Motion and still pictures were taken of targets and pointers on the car roofs to view the behavior and relative displacements of the several cars as they were negotiating the curves.

Determining the Roll

The angle of car body with the vertical, as measured by the gyroscopes, was subtracted from the angle of inclination of the track to give the car body roll for the selected curves. The unbalanced elevation for curves was calculated from the track elevation and curvature given on the track profiles and the speeds obtained on the tests.

From the dynamic car body roll angle the lateral displacements of the eave and skirt points with respect to

Mr. Neuhart is general superintendent, motive power and machinery, Union Pacific, and Mr. Krautheim is mechanical engineer sales, General Steel Castings Corporation.



MOTION and still pictures were taken through the dome to record the behavior and relative displacements of the cars in negotiating the curves.

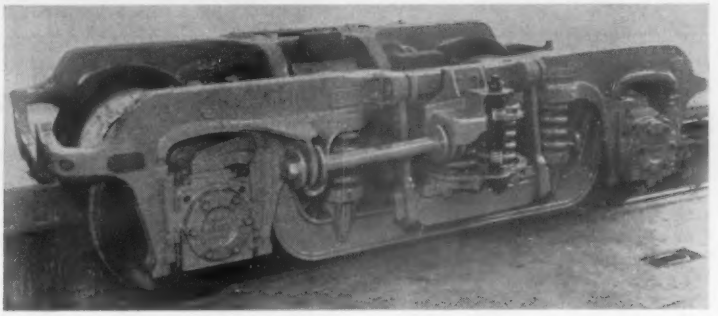
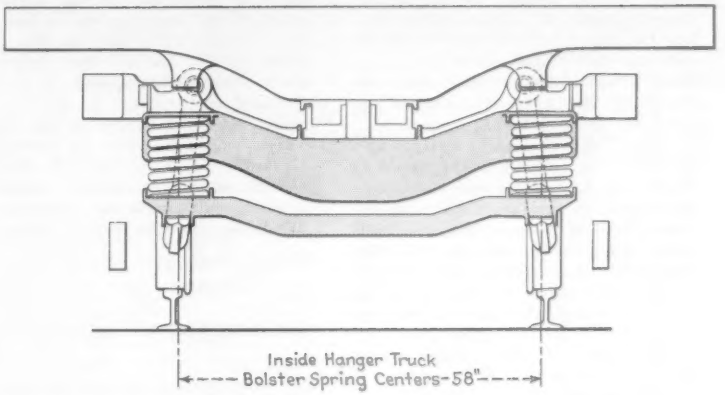
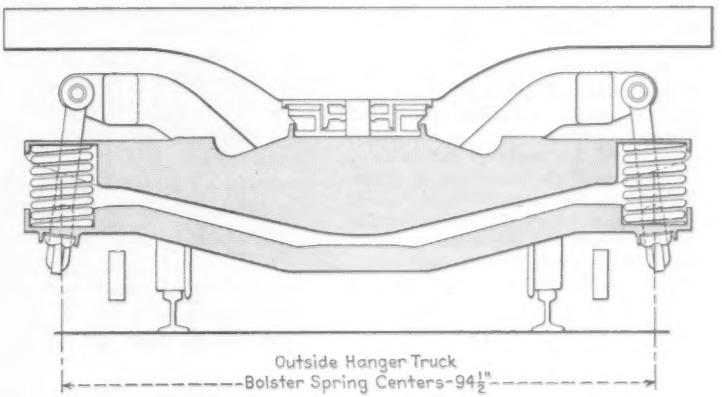


PHOTO of the outside swing hanger truck is a simplified cross section of such a truck at the bolster showing how it increases the distance between bolster spring centers over the inside hanger truck below.





the center line of track were calculated for the test curves. To these displacements were added the lateral dynamic displacements between the truck frame and bolster giving total lateral displacement. Adding the roll and the total displacement gives the overall effect of the curve on clearances.

From these data the following difference was found between the transverse displacement at the eaves of the two cars at 6-in. unbalanced elevation for the static and dynamic tests:

	Static Lean Inward	*Dynamic Lean Outward*
New Dome Car	6.60 in.	7.20 in.
1941 Sleeper	9.60 in.	12.30 in.

Thus the static lean inward of the dome car is only some two-thirds that of the sleeper, while the dynamic lean outward is a little over half as much. Adding the inward and outward leans together gives a total of 13.8 in. for the dome car vs 21.9 in. for the sleeper. Translated into clearances the occupied space of a dome car standing on a 6-in. elevation curve being passed by one moving at 6 in. of unbalance will be approximately 8 in. less than that of a pair of sleepers for the same conditions.

Roll measurements for 6 in. unbalance showed the angle to be 1 deg 45 min for the dome car and 3 deg

38 min for the sleeper. The roll in both cases was also found to vary directly with the increase in track elevation. The better behavior of the dome car under all conditions, despite its longer travel bolster springs and higher center of gravity, is attributed to the use of the outside swing hanger, wide bolster spring base truck and the stiffer equalizer springs.

Tests conducted by the AAR and AREA have shown that there is a correlation between passenger reaction or comfort and the amount of unbalanced centrifugal force on curves. This was determined by measurements of the mean lateral acceleration. Comfort is also affected adversely by car body roll which so far as the passenger is concerned, reduces the effective elevation of the track.

Values of the measured lateral acceleration with reference to the calculated unbalanced elevation were plotted for the two cars tested and straight lines were drawn through the general trend of the points. The slope is an indication of the "comfort" ability of the cars to go around curves. The greater the amount of calculated unbalanced elevation that can be obtained with a given amount of measured acceleration the better the "comfort" factor.

The AREA used an acceleration value of .10g as an acceptable upper limit of lateral acceleration.

Accepting this as a criterion for permissible unbalanced elevation, the calculated unbalanced elevation should be limited to 3.60 in. for the sleeper and 4.55 in. for the dome car, i.e., the dome car could operate at approximately 1 in. greater calculated unbalanced elevation than the sleeper for the same comfort factor, so far as the effect of roll is concerned.

The Meaning of Unbalance

The term "inches of unbalance" or "unbalanced elevation" referred to frequently in the article can perhaps best be understood by referring to the above sketches.

For any degree of curvature with a given superelevation (height of the outside rail over the inside rail), there is an "equilibrium" speed shown in the center sketch. If the curve is taken at a speed below this, the car leans toward the inside. If the car takes the curve faster, it leans toward the outside, and the faster the car goes the more it approaches the overturning speed.

The "equilibrium" speed can therefore be defined as the speed at which the wheels on one side press downward on the inside rail with the same force as those on the other side press down on the outside rail (the condition that exists on straight track). In other words, it is the speed at which the floor of the car is parallel to the top of the rails.

If a curve is taken above equilibrium speed so that 6 in. more superelevation would be required for the wheels on both sides to press equally on the rails, that is spoken of as 6 in. of unbalance.

The roll of the car body is the difference between the track angle and the car angle. At equilibrium speed the car angle is equal to the track angle, and the angle of roll is zero. The roll angle is inward, or negative below this balance speed—outward, or positive, above it. Below equilibrium speed, the car angle is equal to the track angle plus the roll angle. Above equilibrium speed, the car angle is equal to the track angle minus the roll angle.

Thus, one effect of the roll is to partially neutralize the superelevation, or banking, of the curve in counteracting the centrifugal force on the passenger. A second major effect is on clearance which is determined by the roll plus car width, overhang at both ends and center and lateral movement of body relative to track. This lateral movement is indicated by the displacement of the center plate in the two end drawings. It adds to the total effect of the curve either below or above equilibrium speed.

Standard practice is to set the speed limit on curves as the speed which would require an additional elevation of 3 in. for equilibrium (i.e. 3 in. of unbalance). This gives a slight roll, or lean, outward, but has been found to be well within the limits of passenger comfort. The curves on this test were therefore taken above the speed normally set for comfort of the passengers, which is of course well below the speed at which the car would overturn.

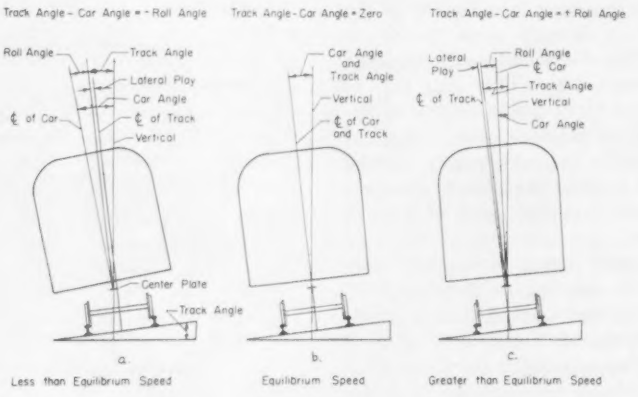
Three examples of curves and the speeds at which they were taken for this test were:

A 6-deg curve with 4½ in. superelevation at 50 mph. As 10½-in. superelevation would be needed for equilibrium, this represented an unbalance speed of 6 in.

A 1-deg curve with 3½-in. superelevation at 90 mph, a 2.2-in. unbalance speed.

A 3-deg, 4½-in. superelevation superelevation curve, at 60 mph representing a 3.8-in. unbalance speed.

Representations of Car Body Position

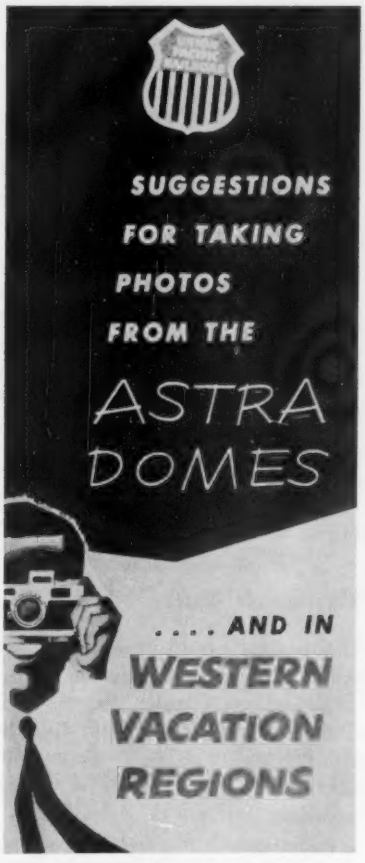


THE FILMIN' is easy from "glass-house" perch on Great Northern's Empire Builder as it runs through scenic Cascades Range.

ADVERTISING tie-in of picture taking possibilities is used by Santa Fe.

Dome Cars Click with Shutterbugs

Rail travelers finding them ideal for films and stills as roads capitalize on their appeal with novel sales lures



UNION PACIFIC booklet offers tips for getting best pictures along its route.

Time was a passenger had to weather a backwash of cinders through a window or "shoot" from the observation platform to take pictures from a moving train. This produced some fine photos of track dwindling in the distance but did little to enthuse camera fans.

And it left some of the country's most breathtaking panoramas to be recorded only by camera-toting mountain climbers.

But now, several Western roads with exceptional scenic advantages have recognized the potential of the dome car as a vantage point for lenswork and are going all-out to promote it as such to tourists.

For example, a "Zephyrette"—a hostess—points out choice subjects and gives helpful shutter tips to travelers on the "California Zephyr." The Union Pacific offers a brochure suggesting composition ideas for taking pictures in such places as Yellowstone National Park. The Santa Fe distributes a leaflet on the same order, with the added feature of a time schedule for the best picture possibilities.

The Canadian Pacific offers a similar pamphlet at ticket offices and travel agencies to encourage use of its dome cars while the Great Northern, Western Pacific and Milwaukee have featured picture-taking in their advertisements as a dome travel attraction.

SUBJECTS abound as this Santa Fe aide suggests to photographers.

Railroads—Here's Your

ARE THERE ANSWERS TO THESE QUESTIONS?

- What exactly is competition in transportation?
- What pricing policy by transportation agencies is necessary to enable the people of a country to get the most and best transportation service for the least expense?
- What effect does reduced cost of transportation have on methods of industrial production and people's standards of living?
- What precisely is meant by the "cost of transportation"? Is it the carrier's cost or the customer's cost that is the more important? Is it past costs or future costs that should govern policy decisions?
- What are "internal subsidies"?
- Do railroads really need precise cost information—and is it obtainable?

...YES, SAYS THIS CRITIQUE OF NEW BOOK ON TRANSPORT ECONOMICS

A Commentary — By J. G. LYNE

Editor, Railway Age

The organized truckers—in their campaign against the Cabinet Committee recommendation that common carriers be allowed to make rates as low as their costs permit, to compete for traffic—have denounced this proposal as a "hunting license," to enable the railroads to go gunning after other carriers' traffic.

In every other business except transportation service, the competitor with a low-cost product has the right to underprice his rivals. That's how, a generation ago, Henry Ford brought the automobile—previously a rich man's toy—into everyday use by millions of families of modest means. It was pricing to reflect the declining costs of mass-production that reduced the radio from a $100-and-up article to the $20 range; and it is such competitive pricing that is putting TV's and electric iceboxes into the homes of the millions.

Unregulated truck operators (doing 65 per cent of all trucking) have an unlimited license to take every pound of freight they can away from the railroads, if their costs will let them. And unregulated waterway operators (who handle 95 per cent of waterway traffic) are not restrained from diverting all the tonnage they can from the railroads. In the realm of surface transportation, it is only the common carriers (principally railroads) that have no hunting license; and letting them have one is being represented to the public as a bad thing.

Bad for the high-cost carriers, maybe, but not for the public welfare. Overwhelming evidence on this question comes now from a source of unimpeachable competence and disinterestedness—a British economist who, without any reference whatever to conditions in the U.S.A., has presented a comprehensive analysis of the economics of transportation, with particular attention to the problem of competition between rival methods of movement.* The author, A. W. Milne, who is lecturer in economics at the University of Durham, says:

"When the standard of living is lower than the community as a whole desires, the economic exercise must be to ensure that needless costs are not incurred; and this requires the existence of some pricing system which will indicate the relative costs of different commodities and services."

By way of illustration, the author tells of a shipper who is debating whether to provide the transportation he needs with his own vehicles—or to use the services of a common carrier. Now—from the standpoint of the national welfare—the shipper *should* choose the agency which will do his work while using up the least quantity of scarce resources (e.g., man-hours and capital investment). But this shipper won't know or care what the use of scarce resources (i.e., the economic costs) of the common carrier is. All he knows or cares about is the common carrier's *rates*. He will compare the common carrier *rates* with what he figures his own *costs* would be, if he should become a private carrier.

So if the common carrier's rates should happen to be held at a level far above carrier costs—it could easily occur that the shipper might choose private transportation, even though its economic cost (use of scarce resources) was higher than the cost of common carrier service. Thus, to hold common carrier rates at artificially high levels induces traffic to move in ways which waste the country's scarce resources.

Customer's Costs

The author emphasizes, again and again, important aspects of transportation costs which many transportation people sometimes tend to overlook. For example, it is *total cost to the user* of transport that is

*"The Economics of Inland Transport," by A. W. Milne. Published in England by Pitman Publishing Corporation (New York address: 2 W. 45th street)

"Hunting License"

important—not just the cost of the service to the transportation supplier. If one form of transportation requires more packaging, or more expense for intraplant handling, than another—then these extra costs must be added to line-haul costs to arrive at the true total cost of that form of transportation. Mr. Milne might have added, but didn't, that the expense to which the taxpayers are put for a transportation operation is also a part of its true cost.

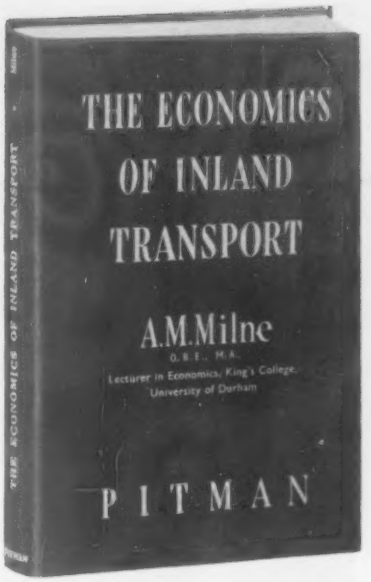
But such omissions of essential aspects of any question of comparative transportation costs and pricing are mighty hard to find in this Milne book. He raises and answers scores of such questions. For example:

What is competition in transportation? Some people have assumed that competition exists when all forms of transportation—rail, water, highway—are actively bidding for the same traffic. Since not all the rivals are capable of doing a particular transportation job with precisely equal economy, the only way you can have all rivals effectively bidding for the same movement is to handicap the abler rivals or give artificial help to the less efficient. But when there is such interference with normal competitive forces, you no longer have genuine competition.

True competition, as Mr. Milne points out, exists when there is a "choice of means of transport to convey different traffics." If a shipper gives 100 per cent of his traffic to one form of transportation, competition has not ended—so long as there is no arbitrary prohibition which will prevent the shipper, later on, from changing his mind and shifting his traffic to another method of transportation.

The demand for transportation, the author points out, is highly "heterogeneous"—i.e., there is a wide variety of qualities of service that shippers are looking for. One wants rapid movement, but at irregular intervals, from inside the producer's plant directly to the point of consumption—and is prepared to pay a premium for such custom-built service. (That is, higher costs for transportation are more than offset by savings in other factors in the production process—this being the situation in which high-cost air freight service is finding a growing market.) Another shipper wants lowest possible point-to-point charges and is not especially interested in speed or personalized service. And so on.

As long as there is no legal or regulatory obstacle that prevents the shipper from shopping around for the lowest price he can get for the kind of service he wants—and as long as producers of transportation are free to seek customers, using their cost or service advantages freely in bidding against their rivals—then you have competition in transportation. And, as Mr. Milne observes, it is entirely in harmony with transport competition that an established form of transportation be allowed to engage in other forms, whenever it so desires.



Which Cost?

What, precisely, is the economic cost of transportation? Mr. Milne says this cost "can be considered from a retrospective or prospective point of view." That is to say, we can inquire into costs which have already been incurred, or we can look at those now being incurred or which will have to be incurred to provide service in the future. For purposes of policy-making, current and future costs are important.

From this point of view, the cost of plant and equipment is not the existing investment, but the depreciation charges that must be accrued so the plant being used for transportation can be replaced when it is worn out. "The compilation of the rail cost must not include the original cost of resources inherited from the past and must include the replace-

(Continued on page 83)

DO RAILROADS NEED TO KNOW COSTS?

"At one time the view was held that it was impossible even to attempt to determine the particular rail costs of moving particular amounts of traffic. When the railways possessed a virtual monopoly of inland transport there was, of course, less need to ascertain the particular costs of particular services. But with the development of other forms of transport the need to cost particular rail services has become urgent.

"As we have noted, cost provides the basis of transport coordination. If the ascertaining of the costs of particular services is in fact impossible, then there is no economic means of coordinating rail transport with other means of transport. But this extreme view is no longer so strongly held. While the difficulties are great, it is now admitted that it is possible to make some attempt at determining the particular rail costs of carrying particular kinds of traffic and of operating particular kinds of service."

WM. J. HEDLEY
President-Elect

G. M. O'ROURKE
Retiring President

Engineers' Job Today—

Persons in supervisory or administrative positions, if they are to meet with success, must know how to "build people"——This theme was developed in several addresses last week at AREA convention

Building people is an art just as complicated and just as important as building tracks and bridges. Judging by the way a number of speakers hammered away at this fact last week at the American Railway Engineering Association convention, it is now recognized that the most capable engineer will fall short of doing the best job for his employer unless he knows how to deal with people, especially subordinates.

It is apparent, furthermore, that this truth applies not only to engineers but to all others in administrative or supervisory capacities—from presidents to section foremen.

The addresses expressing these thoughts were among about 15 special features sandwiched in between the reports of the association's 23 standing committees during the three-day session at Chicago's Palmer House. The overall impression given by the convention is that, through research and technological development, great progress has been and is being made in the science of constructing and maintaining railway fixed properties, but that effective application of this knowledge is dependent on the degree to which the science of human relations is recognized and put to practice.

"Sam" Becomes a Boss

"Building People" was actually the title of one of the addresses. Harvey C. Marmaduke, consultant, management-employee relations, was the speaker on this subject. He developed his theme by tracing the experience of a hypothetical character —one Sam—an engineer whose good record and ability made him a candidate for promotion to supervisor.

As a result, "his responsibilities mushroomed overnight." From a worker, he became "interested in more than a single phase of the job." He became interested in people. "But did the promotion carry with it a magic wand, giving him overnight all of the things he will need as a supervisor? Did it make him a leader, a trainer or adept in developing his qualities in others? I think it is agreed that the answer is a loud 'no!' "

Mr. Marmaduke expressed the wish that "it were possible to put a pair of high-powered glasses on the nose of every newly made supervisor, in fact, every man in management. Even in this atomic age we all must recognize that it is not possible to manufacture good leaders. There are a few who are born 'naturals' but most must learn by trial and error."

"What can be done to help Sam acquire the super-vision he needs as a leader of people?" asked Mr. Marmaduke. He outlined five lessons that he feels would be helpful. These are:

(1) Study subordinates; (2) be human and considerate of others—learn to like people; (3) delegate responsibility; (4) let others in on plans—tell them the hows, the whys, and the wherefores; and (5) make people want to do things.

What Makes People "Tick"?

By studying his subordinates, Sam will find "that praise may spur one person to great heights. It may only inflate another. Constructive criti-

RAY McBRIAN
Vice-President

B. R. MEYERS
Vice-President Elect

N. D. HOWARD
Executive Secretary

Building Better Manpower

cism is a tonic for another. He will find there are those, too, who will not respond to criticism or praise. He will learn to hunt for the things that will make his workers 'tick,' the things that will move them to increased heights of effectiveness. He will learn to search beyond the immediate work situation, too, because people's motives and attitudes are conditioned by personal history and home life."

In learning lesson No. 2—to be human and considerate—Sam may be handicapped because he is not warmhearted by nature. "It is hard for him to be even cordial to certain people and they in turn with him. Sam must recognize this and take steps to warm relations with those around him. How? Among the accepted devices are to use first names, discuss hobbies and not too-personal family matters, and help others over the rough spots. Sincere moves of this sort will pay dividends in friendships as well as in accomplishment."

"Everyday consideration of others will be reflected in the little things Sam will do. Being courteous to his workers and fellow supervisors is one way. Another is to make his wishes known by requests or suggestions. He will, thus, put himself in the places of workers when making

BOARD OF DIRECTION of the American Railway Engineering Association in session at Chicago on March 12. Seated around table, reading clockwise: F. R. Woolford, chief engineer, Western Pacific; C. H. Sandberg, assistant bridge engineer, Santa Fe system; E. S. Birkenwald, engineer bridges, Western lines, Southern; Norris V. Engman, assistant to secretary, AREA; Nancy Campbell, stenographer; E. G. Gehrke, assistant secretary, AREA; N. D. Howard, executive secretary; G. M. O'Rourke (president), assistant engineer maintenance of way, Illinois Central; C. B. Porter, assistant to vice-president, construction and maintenance, Chesapeake & Ohio; W. H. Giles, assistant chief engineer system—construction, Missouri Pacific; E. J. Brown, chief engineer, Burlington lines; H. B. Christianson, special engineer, Milwaukee; H. R. Peterson, chief engineer, Northern Pacific; B. R. Meyers, chief engineer, Chicago & North Western; A. B. Hillman (treasurer), chief engineer, Belt Railway of Chicago—Chicago & Western Indiana; R. H. Beeder, assistant chief engineer system, Santa Fe.

Left to right, standing—G. W. Miller (past president), engineer maintenance of way, Canadian Pacific; Wm. J. Hedley (vice-president), assistant chief engineer, Wabash; Ray McBrian (vice-president), engineer standards and research, Denver & Rio Grande Western; C. G. Grove (past president), area engineer, Pennsylvania.

FOR MORE CONVENTION PICTURES ▶

NEWLY ELECTED OFFICERS

Results of the election of officers were announced at the AREA annual luncheon last Wednesday. The new officers are: President, William J. Hedley, assistant chief engineer, Wabash, St. Louis; and vice-president to serve two years, B. R. Meyers, chief engineer, Chicago & North Western. Ray McBrian, engineer of standards and research, Denver & Rio Grande Western, and a vice-president of the association, was automatically advanced to senior vice-president.

The directors elected are: G. H. Echols, chief engineer, Southern system, Washington; R. R. Manion, chief engineer, Great Northern, St. Paul; L. A. Loggins, chief engineer, Texas & New Orleans, Houston; and W. G. Powrie, chief engineer, Milwaukee, Chicago.

Members of the nominating committee are: A. V. Johnston, chief engineer, Canadian National, Montreal; J. C. Jacobs, engineer maintenance of way, Illinois Central, Chicago; A. B. Stone, chief engineer, Norfolk & Western, Roanoke, Va.; W. C. Pinschmidt, engineering assistant to vice-president, Chesapeake & Ohio, Richmond, Va.; and W. M. Jaekle, chief engineer, Southern Pacific, San Francisco.

decisions affecting them. He will treat their pride, personalities and self-respect as assets. He will not trample on them." In other words, said Mr. Marmaduke, if Sam must criticize he will do it in private, not in public. However, he will quickly learn to praise in public, and will never fail to recognize and give credit to the one who is responsible, and at the same time recognize all who had anything to do with an accomplishment.

Sam can be impressed with the need for learning how to delegate responsibility (lesson No. 3) by observing men who, with others idle, "are hard at work late at night in empty offices." Their trouble, said Mr. Maraduke, lies in failure to recognize that responsibility in a management job is far greater than the personal capacity to carry out all details of the job. "No one expects the chief engineer to drive the spikes. Certainly no one expects the company president to personally manufacture, package and then sell his product."

"It is important for Sam to learn that successful delegation of responsibility includes (1) spelling out responsibility in a clear-cut manner, (2) fixing limits of authority, (3) keeping control, and (4) fixing standards. . . . The manager who keeps his mind on the details of every job discourages the ingenuity of subordinates by competing with them."

The fourth lesson that Sam must learn is the importance of letting others in on plans and programs. "By letting others have a part in making changes, things will go smoother because they will assume a certain amount of personal responsibility for the success of the plan or program. Above all, Sam must learn to give courteous hearing to the ideas of others concerned and *never* ridicule an idea."

It's a Matter of Leadership

In learning the last of the five lessons—how to make people want to do things—Sam will have to learn "the true meaning of the word 'leadership'—that people do things reluctantly for the driver because he *forces* them.—enthusiastically for the true leader because he makes them *want* to follow his wishes." Knowing the previous lessons will make the accomplishment of this one a matter of course, said Mr. Marmaduke.

"If I were a great oculist, I think I could give Sam super-vision by prescribing a pair of bifocal glasses with the distance vision for looking ahead, for planning, and the short vision for the job to be done here and now." In his prescription for these glasses Mr. Marmaduke "would recommend that humanness, consideration and kindness be ground into the lenses. Then there would be an ingredient that would give him the ability to delegate responsibility, and he could see the value of studying subordinates and letting others in on plans and programs. Finally I would have them grind into these lenses a permanent reminder that a good leader cracks no whip—jabs no needle. He gets things done through people by making people want to do things."

Conformists and Others

The general subject of "building people" was dealt with from a different approach by W. E. Cornell, engineer of track, Nickel Plate, whose subject was "Better Human Relations as a Key to Improving Maintenance-of-Way Work." Mr. Cornell does not believe that "you can't teach a man to handle men because they are all different." He is "certain the situation is not that hopeless." He agrees that all men are different, "but their differences in this respect fall into two main classifications, the conformist and the nonconformist, on the ratio of about 19 to 1 . . . . Granted that you figuratively have to kick 1 out of 20 men; is that any logical reason why you should loose the improved performance of 19 simply because you may find one who does not fit the pattern?"

Mr. Cornell suggested that perhaps there needs to be a shift of emphasis from material things to the human element. "It is interesting to note that, while almost 50 per cent of railroad operating revenue is spent for labor, the greater emphasis on improvement in railroad operation has been on machines and materials which, together with fuels, take less than 25 percent of the operating revenue.

"From these figures it can readily be seen that a very small improvement in the efficiency of labor performance will amount to dollars very quickly."

"Recent University of Michigan studies indicate that the average U. S. worker produces at only about 41 per cent of his capacity. It would therefore appear there is much room for improvement in the efficiency of the individual without endangering his health; and I believe it has been fairly well accepted by doctors that, whether mentally or physically employed, the stress and strain on the individual is generally very closely related to his attitude toward his job and the people with, or for, whom he works, and not necessarily to the energy expended."

All of us, said Mr. Cornell, have

seen "poor attitudes and subsequent unsatisfactory performance result from discourtesy in the form of sarcasm and ridicule. A man will forget many other unpleasant things about his job a lot quicker than he will forgive or forget being ridiculed by his boss."

"On my railroad a review of the records of 45 track foremen, almost all of whom I've known personally for 15 or more years, indicated a very definite relationship between good safety performance and good work performance and the manner in which the foremen treated his men. Those who have the best performance records are also known for their fairness and consideration in handling their men."

"It is axiomatic," declared Mr. Cornell, "that nothing can be accomplished satisfactorily by a group without cooperation of some sort. In broad terms there are probably two methods of obtaining cooperation. One of these can be classed under the heading of fear—fear of physical or mental abuse or economic fear, that is, fear of loss of job. And the other, and by far the most effective way to obtain the necessary cooperation is by principles of good leadership.

"It has been well established by studies and by practical observation that there can easily be a difference of 50 per cent or more in the results obtained between these methods of getting cooperation, depending on how closely the fear-driven cooperation can be supervised. If anyone has that much supervision they should lay off the men and put the supervision to work."

A New Type of Engineer

The third major address dealing with the general subject of "building people" was delivered by Wayne A. Johnston, president, Illinois Central, at the annual luncheon of the association. A shift of emphasis is seen by Mr. Johnston from the "rough and ready engineers" required during the era of railroad construction to engineers capable of solving a wider variety of problems.

He first drew a picture of the engineers who came into the Middle West during the period of railroad construction. "Those engineers, some of them smooth-faced boys fresh out of eastern schools, pushed the new

H. R. Peterson, chief engineer, Northern Pacific; E. S. Birkenwald, engineer of bridges, Southern.

D. C. Teal, superintendent water supply, Chesapeake & Ohio; J. E. Wiggins, Jr., of the Southern.

T. Hoffman, service engineer, P&M Co.; Donald F. Lyons, assistant engineer, Chicago South Shore & South Bend; W. D. Kirkpatrick, assistant to chief engineer, Missouri Pacific.

From the Canadian Pacific—A. W. Munt, supervisor work equipment, eastern region; N. W. Kelley, district engineer, Ontario district; J. L. McQuarrie, special engineer.

J. R. Thompson, vice-president, Railway Age; W. B. Blix, manager, Railway Equipment Division, Nordberg Manufacturing Company; M. B. Dewire, president, T. F. Scholes, Inc.; H. R. Dunlop, sales representative, Railway Age.

H. E. Snyder, managing director, Toncan Culvert Manufacturers' Association; Wm. J. Hedley, as istant chief engineer, Wabash; E. R. Englert, assistant engineer, Louisville & Nashville; W. H. Huffman, assistant engineer of maintenance, C&NW.

From Southern Pacific—V. R. Cooledge, assistant engineer of bridges; G. E. Stewart, division engineer.

W. H. Ripkin, district manager, Fairmont Railway Motors, Inc.; A. T. Vakili, Iranian State Railways.

L. L. Lyford, assistant chief engineer (retired), Illinois Central; R. J. Gammie, chief engineer, Texas & Pacific.

C. I. Hartsell, division engineer, Chesapeake & Ohio; R. A. Morrison, Cleveland Frog & Crossing Co.

railroad over rivers and hills and through prairies, swamps and forests.

"There were manpower and material shortages. Contagious diseases sometimes depopulated entire work camps. Often there were ugly fights among unruly workmen, serious clashes with native farmers. The means of transporting men and materials were slow. Picks, shovels and wheelbarrows were the principal tools in grading. Ox and mule teams with slip scrapers helped speed the work."

This era has now passed, "and yet there is still a need for trained engineers in the railroad business." Such engineers, said Mr. Johnston, fit into the railroad picture practically everywhere because they have the "scholastic background, the technical competence, to meet and solve a wide variety of railroad problems."

He referred to the trend toward lightweight equipment, which he asserted, "can't be bounced around. If it is, the bumpy ride will chase the customers away. George O'Rourke (assistant engineer maintenance-of-way of the Illinois Central and president of the AREA) tells me that European engineers criticize our track structure. They say it is not good enough for their trains.

"Our streamline equipment with its spring arrangement and snubbers, with articulated couplings and other devices, eliminates the discomfort that otherwise might be caused by our standards for track work. But if lightweight equipment of the type used by European railroads should prove to be practical for widespread use, we may need to change our thinking about line and surface."

The engineer of the future, continued Mr. Johnston, will in some ways "have to be a better engineer than his father and his grandfather before him. He may not have to fight malarial swamps as his predecessors did. The wintry blasts may not be as cruel or the broiling sun as hot, because modern devices have lessened physical discomfort. But the engineer of the future will face problems of human relations far more complex than those faced by his forerunners.

"The open prairie of a century ago has become a great sprawling city in which a tangled mass of deeds and legal documents make property changes a complicated business. Then, too, the competition in transportation is such that the engineer of the future will need more and more to have the skills of the business man, the accountant, the public relations man. An operation that was once simply a battle against nature has now become a complex interweaving of technology, law, business and human relations."

"In other words, the day of the rough and ready engineer largely has gone. The new engineer will need the same qualities of self-reliance, of loyalty and dependability possessed by the engineer of the past, but in addition he will have to possess skills beyond sheer engineering. He will, for example, need to know how to handle men in a way that was not known in the past.

Benchmarks and Yardsticks

IMPROVEMENT IN WAGES and working conditions in any industry, and in industry as a whole —and reduced prices to stimulate greater sales, hence protecting jobs —are wholly dependent upon increased production per man-hour.

The bituminous coal industry has recently been "looking up." One of the reasons, doubtless, is the rapidly increasing mechanization of that industry—an important result of which is that output per man-hour in the bituminous mines in 1954 was 148.8 per cent of the 1947-49 average (i.e., the average for these three years being given the index number of 100). In anthracite mining, the output per man-hour was 116.7 per cent of the 1947-49 average. These figures appear in an article in the February Monthly Labor Review, published by the U.S. Bureau of Labor Statistics.

In the copper-mining industry, 1954 production (recoverable metal) per man-hour was 106.5 per cent of the 1947-49 average. In lead and zinc mining the latest figure was for 1953, when the index stood at 112.1 In iron mining, production (usable ore) per man-hour in 1954 was 93.2 per cent of the 1947-49 average. In other words, average output per unit of working time decreased 6.8 per cent.

Similar figures for the railroads show a 1954 index of 130 per cent of the 1947-49 average for ton-mile production per man-hour, in freight service. But in passenger service the output of passenger-miles per man-hour in 1954 was only 91.6 per cent of the 1947-49 average. That is, there was a decline in output per man-hour of 8.4 per cent. Taking passenger and freight service combined, the output per man-hour index in 1954 was 125.7.

In the January issue of the Monthly Labor Review, comparisons of output per man-hour were made for the manufacturing industry, but the basis for comparison differed from the foregoing—in that performance for the year 1947 was taken as 100, and the latest year for which information was given was 1953. This comparison showed 1953 output in manufacturing as 122.5 per cent of the 1947 man-hour performance, a figure roughly comparable to the improvement in average railroad performance.

The comparative performance of the railroads, thus, is creditable—being, on the average, just about the same as that of the manufacturing industry and better than that of some but not all of the non-manufacturing industries. On the other hand, the railroads' ratio is not as favorable as it could well be, if all railroad performance were as good as the best. Such ratios measure railroad progress in meeting their serious competitive problems —hence their steady improvement should be the constant objective of everybody in and around the railroad industry. J.G.L.

D7 TRACTOR-NO. 70 SCRAPER ON GREAT NORTHERN ELIMINATES TRAIN HAUL FOR EMBANKMENT MATERIAL

The Great Northern extended two railroad sidings near Dutton, Montana—an industry track 763.6 feet and a passing track 3651.2 feet. Subgrading required moving 10,650 cubic yards of dirt from borrow pit to fill.

At the outset, it appeared that it would be difficult to get enough dirt from the borrow. Plans were made to bring in more than half the yardage by work train. Then the Great Northern put its CAT* D7 Tractor with matching No. 70 Scraper on the job.

Working most of the time without a push loader, the big yellow team was able to get all the dirt needed from the borrow. The work train was not needed, and the Great Northern saved considerable money.

And now the economy of these hard-working off-track Caterpillar units has been increased even more. The new D7 (Series C) has a new 128 HP engine with a drawbar pull of 28,700 lb. maximum. It has Caterpillar's exclusive oil clutch to give you more efficiency than ever. The new clutch increases work life since the constant oil bath lubrication reduces wear on all moving parts. There is less maintenance—1500 hours without adjustment is not unusual—and no external lubrication is needed.

Many models of Caterpillar-built Scrapers have been given the new, efficient LOWBOWL design which enables you to load more material in less time. In fact, all down the Caterpillar line, new models have been created and new refinements added.

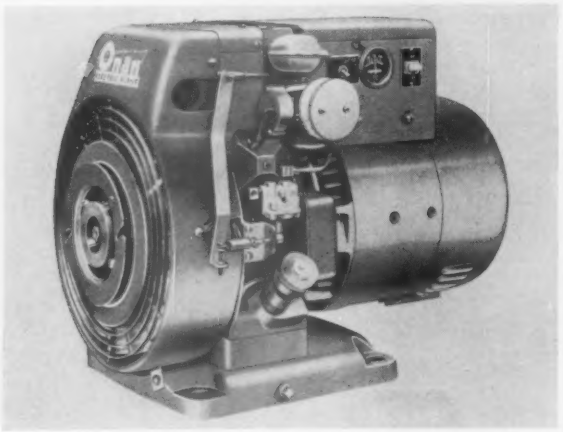
It's time to see your Caterpillar Dealer. He has virtually an entire new line of money-saving off-track equipment to demonstrate—on *your* job.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

CATERPILLAR*

*Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

NAME THE DATE... YOUR DEALER WILL DEMONSTRATE



GENERATING PLANT

A new heavy-duty electric generating plant, Model 2LK, produces 2,000 watts of 60-cycle a-c current at 1,800 rpm (or 1,500 watts of 50-cycle) in all standard phases. Model LK is powered with an Onan single-cylinder, air-cooled, 4-cycle gasoline engine with Stellite-faced rotating exhaust valve direct connected to a blower-cooled Onan generator for permanent alinement. The unit is available in completely self-contained manual-starting models equipped with a recoil rope, starter, mounted fuel tank, muffler, air cleaner, terminal box and vibration box and vibration dampeners. It is also available in electrically cranked remote starting models equipped with mounted control box, exhaust tubing and muffler, air cleaner, separate fuel tank and battery cables. All models are equipped with radio shielding on high-tension wire as standard equipment. Optional equipment includes carrying frames, 2-wheel dollies, automatic controls, emergency line transfer controls, receptacle plate kit and gas-gasoline carburetors. *D. W. Onan & Sons, Inc., Minneapolis, Minn.*•

TWO MOTOR GRADERS

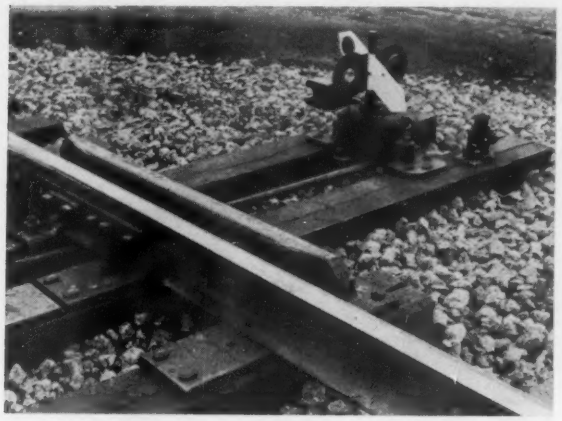
A power-shift transmission, which is reported to permit quick shifts under full load and wide-open throttle, is a feature of two new motor graders. Known as Models 7-D and 6-D, these machines are rated at 140 and 100 hp, respectively. Standard on both graders is a torque converter and hydraulic-booster steering. The last item is said to retain the positive feel of manual steering and is reported to revert to manual steering automatically in case of a power or hydraulic failure. Both models are equipped with a power sliding moldboard which is hydraulically operated from the cab. It is reported that this feature permits the operator to power shift the moldboard out of the way as he approaches an obstruction and then power shift it back to its exact former position. It is further reported that the operator can attain a high bank-sloping angle up to 90 deg and that the blade can be rotated 180 deg without removing the scarifier teeth. *Huber Warco Company, Marion, Ohio*•

ONE-MAN CRUISER CRANE

The Koehring Model 205 excavator is now available in a new version, the 205 Cruiser Crane. One-man operated, the new machine has a 15-ton lift capacity, ½-cu yd digger capacity, and a top travel speed of 21 mph. Gradability tests are said to have demonstrated its ability to negotiate 25 per cent grades in low gear. In addition to the 15-ton lift capacity (rate 85 per cent of tipping), it is said that the unit can lift a load of 12.7 tons (without outriggers) over the back and travel. Both travel and work are handled from one control position. One engine supplies all the power through two major shafts on the upper machinery assembly. The machine has large clutches of the internal expanding type. A 4-wheel drive arrangement has been provided for traction.

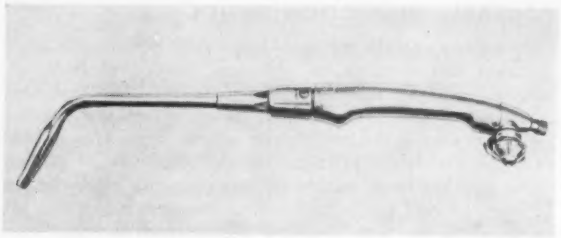
The chassis is of all-welded construction. The body is equipped with outriggers front and back for stationary lifting. The turntable swings on four adjustable hook rollers that are said to resist tipping in either direction. Power

boom lowering is standard and the machine is equipped with safety boom-limit stops. The standard 25-ft boom can be lengthened to a maximum of 55 ft plus straight boom jibs of 15 to 30 ft. *Koehring Company, Milwaukee, Wis.*•



SWITCH-POINT GUARD RAIL

A guard rail for protection of switch points, consists of a 4-ft 9-in. length of heat-treated rail which is securely bolted to the base plates. The head of the guard rail stands higher than that of the running rail. Its purpose is to shove wheels away from the point of the switch, thereby providing protection against derailments from sharp flanges and worn points. The beveled ends of the guard rail provide an easement feature which softens shock to car and lading. The guard rail is reversible so it can be used on either the right- or left-hand side of the track. *Bethlehem Steel Company, Bethlehem, Pa.* •



MEDIUM PRESSURE BLOWPIPE

A new oxyacetylene blowpipe, Oxweld W-45, is designed for medium pressure. Welding heads range in size from 200 to 300-cu ft per hr capacity. Welding-head extensions are available in 12, 15, 18 and 21-in lengths, and head extensions of 10, 12, 20, and 24-in lengths are available for flame priming and descaling. Eight multi-flame heating heads with capacities of from 70 to 300 cu ft per hr are also available for use with oxyacetylene, oxypropane and oxymethane (natural gas) fuels. A new-type locking device, employing a circular spring contained in the head-coupling nut, permits welding heads to be secured in place quickly without the use of a wrench. A quarter turn of the coupling nut is sufficient to hold the welding head in place, and the heads can be swiveled to any convenient working angle without releasing them or extinguishing the flame.

Stainless steel has been used extensively to provide strength and durability. *Linde Air Products Company, Division of Union Carbide & Carbon Corp., New York*•

TRANSLUCENT PANELING

A colorful, translucent, plastic paneling of new material, which is said to be applicable to both interior and exterior construction, is "Allite" translucent plastic paneling. The material is available in a variety of colors, weights, sizes, finishes and degrees of light transmission. It is reported to be shatterproof, weather and fire resistant, lightweight and durable. The panels are available either corrugated or flat. The material is applicable for side-lighting, skylighting, weather shelters and ticket-window separators. *Barrett Division, Allied Chemical & Dye Corp., New York*•

ALL-POSITION ELECTRODE

A new all-position, iron-powder type electrode is said to have the advantages of higher speeds and ease of operation, comparable to those normally associated only with iron powder electrodes in downhand operation. The new electrode, called Improved Fleetweld 47, is for applications where an all-around, universal type electrode is needed for welding in any position. It can be used with either a-c or d-c welding current.

The improved Fleetwood 47 has powdered iron included in the coating. It is said to produce higher deposition rates, resulting in 10 per cent to 30 per cent higher welding speeds than those obtained with conventional E-6013 electrodes and up to 30 per cent more inches of weld per electrode. Bead appearance is smooth and clean and the slag is reported to be practically self-cleaning. The electrode can be operated with either a drag or short arc technique and is claimed to be especially efficient in overhead welding and in poor fit-up situations. *Lincoln Electric Company, Cleveland, Ohio*•

WHAT'S NEW . . .

IN RAILWAY ENGINEERING AND MAINTENANCE

CONVERTIBLE VAN WASHER

A mechanical van washer that can wash vans with closely spaced vertical or horizontal ribs as well as smooth paneled surfaces is now available.

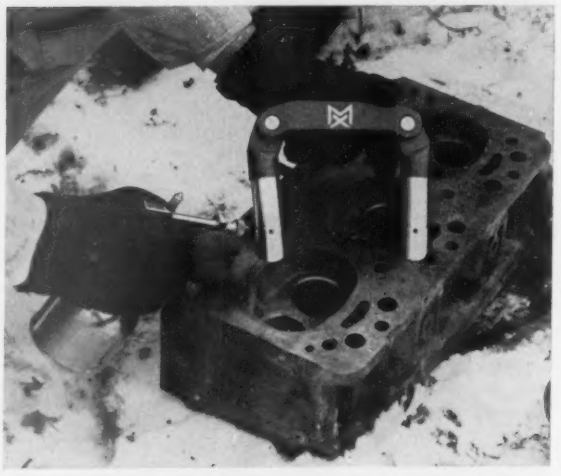
The washer, which has a 250-gal capacity water reservoir, is mounted on the forks of a lift truck with a 130-in. lift capacity and dual wheels. The brush is 9 ft long by 18 in. in diameter and is powered by a 13-hp gasoline engine. The "in and out" brush movement is hydraulically controlled while the "up and down" action is accomplished by lifting the forks of the truck. The brush can wash either in the horizontal or vertical position. Maximum height of the brush in the horizontal position is 13 ft 8 in. and the minimum height is 3 ft 3 in. The brush is controlled from the lift truck by flexible cables. It is said that the position of the brush can be changed from horizontal to vertical in two minutes. *Ross & White Co., Chicago 6.* •

AIR-COOLED ENGINE GENERATORS

Three new generators, driven by air-cooled engines and having ratings of 3,000, 6,000 and 10,000 watts, respectively, have been recently announced. The new units are smaller and lighter, utilizing a quill-mounted generator, that is, one with the armature mounted on the extension of the engine crankshaft and the generator frame solidly connected to the engine. It is said that this arrangement assures permanent positive alinement, as flexible couplings, belts, etc., are eliminated.

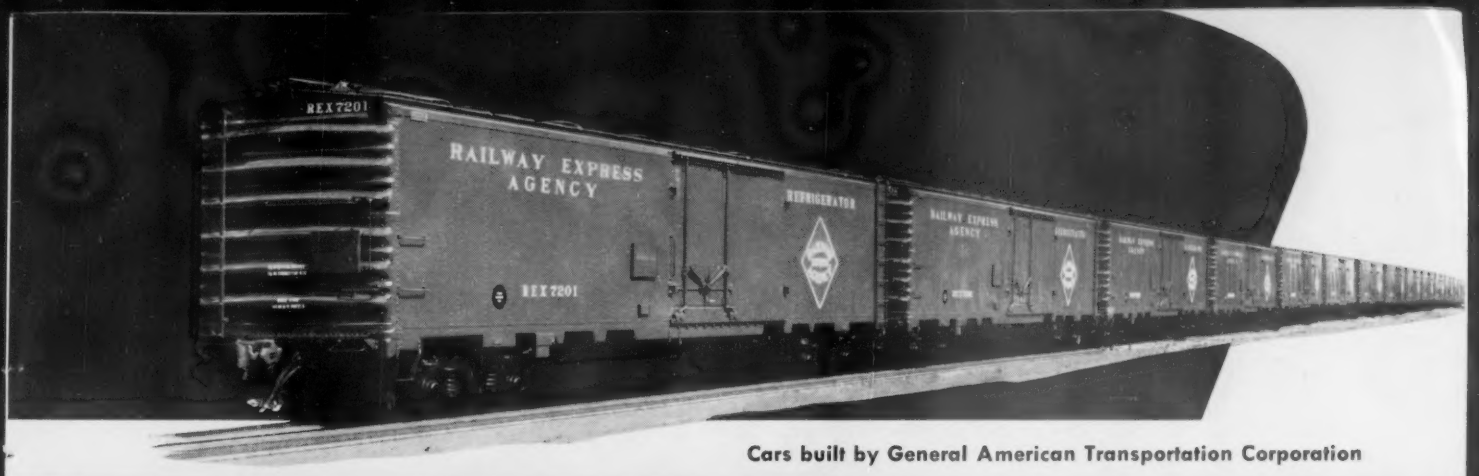
The multi-cylinder engines on the 6,000 and 10,000-watt models are said to provide smooth, relatively vibration-free performance at the conservative operating speed of 1,800 rpm. Engines of this type are rated up to 2,400 and 2,600 rpm.

Several types of starting controls are available for all sizes: (1) electric starting, using the generator as a cranking motor and as a battery charging generator for the starting battery; (2) remote starting and stopping by a push button; and (3) full emergency starting and load transfer when installed as standby equipment for normal power source failure. *United States Motor Corporation, Oshkosh, Wis.*•

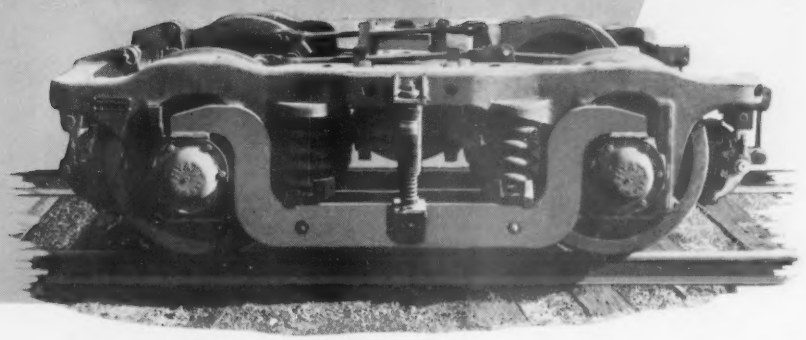


PORTABLE INSPECTION DEVICE

A new magnetic particle inspection device which is portable and requires no electrical power has been announced by the manufacturer. It is reported that this Magnaflux YM-5 Yoke Kit will reliably find surface and fatigue cracks in magnetic parts or members. This is said to make the device practical for the inspection of critical parts and welds in hazardous areas since electric arcing is now reported to be impossible. The new Magnaflux kit comes complete with a metal storage and carrying case and weighs 22 lb. The yoke legs are hinged and the angle-cut tips rotate so that good magnetic contact can be made on parts of almost any shape. The permanent magnet elements are of Alnico and a new magnetic circuit has been developed which is reported to give the YM-5 an especially effective magnetizing power for its weight. It is said that this magnetic pull is over 40 lb on a flat surface as against a weight of the yoke itself of 5 lb. A spray gun, two powder bulbs, and wet-bath and dry powder magnetic particle materials ars also included in the kit. *Magnaflux Corporation, Chicago.* •



Cars built by General American Transportation Corporation



Commonwealth BX Truck

Here's Progress!

500 New Refrigerator-Express Cars for RAILWAY EXPRESS AGENCY Equipped with Commonwealth BX Type Trucks

Because of many years of outstanding performance of Commonwealth Trucks on cars of the Railway Express Agency and railroads throughout the country, this new lot is equipped with latest design Commonwealth BX Type Trucks. When not transporting perishables from the west coast and the south, these cars are used for LCL express shipments and bulk mail handling in fast train schedules.

Equalizers, swing bolsters, coil springs and friction snubbers combine to provide smooth, safe riding of light or loaded cars, protecting car contents, thereby minimizing damage claims. The rigid one-piece cast steel truck frames with integral cross transoms and pedestals insure axles being in tram at all times.

Commonwealth BX Trucks are approved for all types of Express-Refrigerator, Box-Express and Merchandise cars operating in all classes of passenger trains. For dependability and true economy be sure to specify Commonwealth Trucks.

GENERAL STEEL CASTINGS

GRANITE CITY, ILL. EDDYSTONE, PA.

. . . guards perishables under ALL conditions!

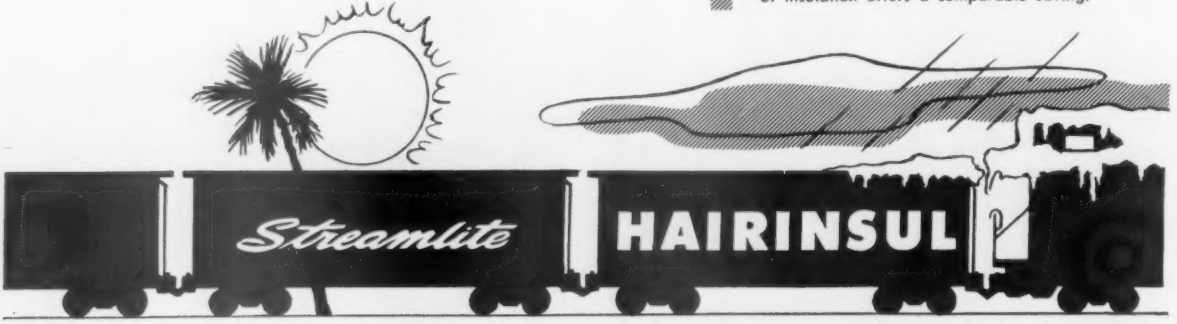
Major refrigerator car builders have been using all-hair insulation for nearly half a century — and today they specify Streamlite HAIRINSUL because of its 40% less weight, higher efficiency and greater economy.

At any location, at any temperature Streamlite HAIRINSUL provides maximum protection to valuable shipments of perishables.

Yes, Streamlite HAIRINSUL assures you all the major advantages listed at the right — and more besides. Write for complete data.

AMERICAN HAIR & FELT COMPANY
Merchandise Mart • Chicago, Illinois

- **LOW CONDUCTIVITY** — Thoroughly washed and sterilized, all-hair heat barrier. Rated conductivity — .25 btu per square foot, per hour, per degree F., per inch thick.
- **LIGHT WEIGHT** — Advanced processing methods reduce weight of STREAMLITE HAIRINSUL by 40%.
- **PERMANENT** — Does not disintegrate when wet, resists absorption. Will not shake down, is fire resistant and odorless.
- **EASY TO INSTALL** — Blankets may be applied to car wall in one piece, from sill to plate and from one side door to the other. Self-supporting in wall section between fasteners.
- **COMPLETE RANGE** — STREAMLITE HAIRINSUL is available ½" to 4" thick, up to 127" wide. Stitched on 5" or 10" centers between two layers of reinforced asphalt laminated paper. Other weights and facings are available.
- **HIGH SALVAGE VALUE** — The all-hair content does not deteriorate with age; therefore has high salvage value. No other type of insulation offers a comparable saving.



SETS THE STANDARD BY WHICH ALL OTHER REFRIGERATOR CAR INSULATIONS ARE JUDGED.

Hunting License

(Continued from page 71)

ment cost of only those resources which the continuing provision of the rail service will require to be replaced."

The author makes it quite clear that arbitrary allocation of fixed or common costs to specific units of production is economically untenable, because common costs are incurred whether or not specific units are transported. So, the economic cost of a given transportation job is the variable cost (wages, fuel, maintenance, depreciation) of that specific movement *plus some part of the fixed costs* incurred for this and other traffic. The assignment of the part of fixed or common costs to be attributed to any particular movement cannot be done by an arbitrary formula, but has to take into consideration "what the traffic will bear." There cannot be much doubt of what Mr. Milne's opinion would be of the "ICC formula" for the allocation of common expenses to passenger service of the U.S. railways.

Another important subject that the author explores is that of "internal subsidies"—that is, providing some services at an out-of-pocket loss, and recouping this loss by higher-than-cost charges on remunerative traffic. Mr. Milne opposes internal subsidies, because they tend to attract traffic uneconomically to the subsidized service and to divert traffic uneconomically from the services where higher-than-cost rates are levied.

The author believes there is a lot of this internal subsidization going on where railways charge the same per-mile passenger fare for heavily patronized through travel as they do on sparsely patronized local trains. If subsidies for some traffic are necessary, then the government ought to provide them.

This book would appear to give complete and irrefutable support by skillful economic reasoning for the latitude in rate-making by common carriers that the U.S. Cabinet Committee report on transportation has recommended. It also makes out just as complete a case, from the standpoint of national economic welfare, for the conclusion that railways need to have a lot more information than most of them now do on specific costs of transportation—not only by rail, but by other methods.

Supply Trade

Robert J. Neumann has joined the sales staff of the Goodyear Airfoam Division of **Beck & Blatchford, Inc.** Mr. Neumann was formerly with the **General Fire Proofing Company.**

John T. Ash and **Walter Wesol** have become vice-presidents of **T-Z Railway Equipment Company** and its subsidiary, **Morris B. Brewster Company,** with headquarters at Chicago.

George L. Ogdin, Jr., assistant general sales manager, Fulton Sylphon division, **Robertshaw-Fulton Controls Company,** has been named general sales manager, at Knoxville, Tenn.

Carl O. Hedner, sales manager of hoisting equipment for **Yale & Towne Manufacturing Company,** has been named assistant general sales manager of its materials handling division, at Philadelphia.

Fenton D. Lapham, parts supply manager of **Electro-Motive Division** of **General Motors Corporation,** has been promoted to director of production control and purchasing, succeeding **William O. Nelson,** who has assumed special duties on the general manager's staff. **D. Gregg Cummings,** merchandising specialist in the division's sales department, has been appointed to the public relations staff in charge of exhibits and general information.

J. E. Huber, west coast district manager, Austin-Western division of **Baldwin-Lima-Hamilton Corporation,** and sales representative at San Francisco, for its Eddystone division car department, is now devoting his entire sales activities to the latter department, serving Arizona, New Mexico and Utah.

Fabian Bachrach

WILLIAM O. BRUCE, sales engineer for Orton Crane & Shovel Co., who has been appointed manager of railway sales, at Chicago.

PIERRE DUMAINE, president of Piggy Back Service Corporation, recently formed to supply the transportation industry with a "packaged" rail and highway piggyback service.

Joseph W. S. Davis, whose recent promotion to manager field sales for spring and forge products, **Alco Products, Inc.,** was reported in Railway Age, January 30, has been appointed regional manager-western region, at Chicago.

Two sales representatives, **William A. Stovall** and **Herbert E. Waterhouse,** have been added to the Atlanta office of **L. B. Foster Company.**

John B. Braham has been appointed sales representative to the Midwestern railroads for the Plastinail Floor Division of **F. E. Schundler Company,** Joliet, Ill.

J. J. Van Horn, Pittsburgh district manager, **Union Switch & Signal—Division of Westinghouse Air Brake Company,** has been appointed executive assistant to vice-president railway sales. He has been succeeded by **T. B. Thompson,** formerly signal engineer, Illinois Central.

Robert V. Simpson, formerly with **American Brake Shoe Company,** has joined the railroad sales staff of **Hyatt Bearings Division, General Motors Corporation,** as a sales engineer.

Dearborn Chemical Company has announced election of three assistant vice-presidents in the railroad department. They are **D. B. Bishop,** Pittsburgh, formerly district manager there; **L. E. Flinn,** Chicago, formerly manager, railroad No-Ox-Id sales; and **A. D. Nicolay,** Omaha, who had been manager, sales and service, railroad cleaner department. **Elton R. Glover** has been appointed director technical sales-service, railroad department.

Melvin C. Erickson has been appointed chief engineer, railway division, **Waukesha Motor Company,** and **Paul E. Mantz,** field sales and service engineer, has been named assistant sales and service manager.

REVENUES AND EXPENSES OF RAILWAYS

(Dollar figures are stated in thousands; i.e., with last three digits omitted)

MONTH OF JANUARY OF CALENDAR YEAR 1956

Name of Road		Average mileage operated during period	Operating Revenues				Operating Expenses										Operating ratio		Net from railway operation	Railway tax accruals	Net railway operating income	
					Total (inc. misc.)		Maint. Way and Structures		Deprec. and Retirements	Maint. Equipment		Deprec. and Retirements										
			Freight	Pass.	1956	1955	Total 1956	Total 1955		Total 1956	Total 1955		Traffic	Transportation	Total 1956	Total 1955	1956	1955			1956	1955
Akron, Canton & Youngstown	Jan.	171	$494	....	$503	$442	$69	$62	$6	$60	$5	$13	$45	$149	$369	$327	73.3	73.9	$134	$65	$46	$41
Atchison, Topeka & Santa Fe	Jan.	13,124	39,465	$3,439	47,000	40,975	6,533	5,410	652	9,737	7,912	2,007	1,199	16,263	36,030	30,916	76.7	75.4	10,969	5,978	4,537	4,505
Atlanta & St. Andrews Bay	Jan.	82	339	1	349	338	36	28	3	26	50	7	7	74	161	170	46.2	50.2	188	83	72	63
Atlanta & West Point	Jan.	93	266	37	365	354	55	43	6	66	59	13	18	153	313	275	85.8	77.5	52	27	3	22
Western of Alabama	Jan.	133	291	36	371	389	60	53	8	76	67	18	21	144	325	293	87.5	75.3	46	26	27	48
Atlantic Coast Line	Jan.	5,287	12,015	1,963	15,131	13,608	2,577	2,247	151	3,005	3,005	603	441	5,582	12,291	11,376	81.2	83.6	2,840	1,525	915	912
Charleston & Western Carolina	Jan.	343	690	....	699	587	166	148	29	111	104	42	20	185	502	447	71.8	76.1	197	110	95	69
Baltimore & Ohio	Jan.	6,020	33,631	1,503	37,282	30,226	4,041	3,214	478	9,219	5,533	1,021	939	16,021	32,204	24,369	86.4	80.6	5,078	2,245	1,830	2,804
Staten Island Rapid Transit	Jan.	29	205	61	270	236	54	41	12	29	24	2	2	143	263	235	97.6	99.3	6	41	—60	—59
Bangor & Aroostook	Jan.	602	1,575	26	1,645	1,197	325	325	16	249	218	101	21	393	1,051	962	63.9	80.4	593	190	347	192
Bessemer & Lake Erie	Jan.	208	1,246	....	1,266	1,120	203	181	17	575	435	140	28	368	1,267	1,066	100.1	95.2	—1	168	250	245
Boston & Maine	Jan.	1,574	5,602	841	7,229	6,732	955	941	143	937	993	215	151	3,311	5,767	5,438	79.8	80.8	1,462	515	364	291
Canadian Pacific Lines in Maine	Jan.	234	771	51	847	821	127	89	23	108	102	17	9	359	620	556	73.2	67.7	227	35	125	182
Carolina & Northwestern	Jan.	284	300	....	305	269	85	53	6	19	16	7	4	80	202	157	66.4	58.3	102	20	35	49
Central of Georgia	Jan.	1,764	3,220	178	3,653	3,603	553	511	42	563	591	150	178	1,433	2,931	2,778	80.2	77.1	722	253	421	547
Central of New Jersey	Jan.	613	4,247	473	5,048	4,563	597	576	94	896	836	173	75	2,243	3,990	3,717	79.0	81.5	1,058	492	337	168
Central Vermont	Jan.	397	806	63	941	860	129	115	16	111	118	11	17	393	694	650	73.7	75.6	247	48	90	50
Chesapeake & Ohio	Jan.	5,132	30,044	527	31,928	26,514	3,618	3,363	402	5,464	4,809	1,527	752	10,997	22,295	19,010	69.8	71.7	9,633	4,757	5,467	4,633
Chicago & Eastern Illinois	Jan.	868	2,543	255	2,999	2,951	302	336	27	476	443	134	133	1,242	2,348	2,276	78.3	77.1	650	207	325	391
Chicago & Illinois Midland	Jan.	130	668	....	685	694	46	64	23	97	123	24	31	156	375	465	54.7	67.0	310	164	157	84
Chicago & North Western	Jan.	7,836	11,560	1,554	14,678	14,674	2,249	2,168	305	3,265	2,838	879	418	7,750	14,553	13,369	99.1	91.1	126	1,192	—1,814	—359
Chicago, Burlington & Quincy	Jan.	8,806	16,349	1,521	19,859	18,583	2,153	2,167	385	3,328	3,440	890	538	8,321	15,276	14,741	76.9	79.3	4,583	2,421	2,041	1,620
Chicago Great Western	Jan.	1,470	2,730	5	2,896	2,750	425	416	40	451	386	122	114	911	1,976	1,858	68.3	67.6	919	344	367	321
Chic., Milw., St. Paul & Pacific	Jan.	10,641	15,948	1,390	19,212	18,463	2,935	2,700	430	4,423	3,872	905	493	8,536	17,621	15,754	91.7	85.3	1,591	1,547	—544	768
Chicago, Rock Island & Pacific	Jan.	7,597	12,989	1,427	15,765	14,470	1,876	1,662	276	2,778	2,532	569	537	6,202	12,312	11,350	78.1	78.4	3,453	1,412	1,390	1,427
Chic., St. Paul, Minn. & Omaha	Jan.	1,616	2,193	141	2,547	2,654	344	342	47	471	404	78	73	1,463	2,492	2,254	97.8	84.9	55	193	—437	—84
Clinchfield	Jan.	295	2,142	....	2,154	1,903	305	328	19	355	302	95	56	477	1,246	1,148	57.8	60.3	908	196	821	669
Colorado & Southern	Jan.	718	1,003	70	1,209	1,212	120	172	18	251	179	42	32	488	959	891	79.3	73.5	250	131	67	134
Ft. Worth & Denver	Jan.	1,362	1,505	146	1,824	1,812	148	309	29	288	269	45	69	707	1,326	1,431	72.7	79.0	499	179	174	148
Colorado & Wyoming	Jan.	40	224	....	349	262	21	18	1	25	34	11	1	122	182	175	52.1	66.6	167	94	71	37
Delaware & Hudson	Jan.	792	4,386	166	4,675	4,235	500	538	49	681	781	171	88	1,633	3,177	3,125	68.0	73.8	1,498	892	688	585
Delaware, Lackawanna & Western	Jan.	962	5,596	837	7,099	6,560	722	678	133	1,053	974	326	200	3,627	5,977	5,311	84.2	81.0	1,122	442	457	481
Denver & Rio Grande Western	Jan.	2,155	5,617	231	6,049	5,753	552	445	94	960	927	290	217	1,964	4,003	3,656	66.2	63.6	2,046	1,131	1,082	1,099
Detroit & Toledo Shore Line	Jan.	50	763	....	822	753	85	82	3	71	57	21	19	232	424	377	51.6	50.1	398	140	107	110
Detroit, Toledo & Ironton	Jan.	464	1,816	....	1,887	1,627	279	228	27	319	159	90	59	459	1,191	894	63.1	54.9	695	263	380	399
Duluth, Missabe & Iron Range	Jan.	570	271	....	333	288	400	303	69	718	546	128	11	625	1,904	1,491	571.0	517.9	—1,570	112	—1,687	—1,297
Duluth, South Shore & Atlantic	Jan.	553	573	4	602	523	112	122	10	116	123	24	30	213	497	477	82.4	91.1	106	32	59	5
Duluth, Winnipeg & Pacific	Jan.	175	600	1	606	511	62	52	4	87	68	2	6	261	425	352	70.1	68.8	181	48	53	28
Elgin, Joliet & Eastern	Jan.	236	3,722	....	4,511	3,726	263	208	27	858	495	109	35	1,717	3,077	2,218	68.2	59.5	1,435	646	292	567
Erie	Jan.	2,225	11,921	593	13,422	12,184	1,248	1,190	212	2,160	1,995	513	398	6,360	10,899	9,799	81.2	80.4	2,523	941	863	1,005
Florida East Coast	Jan.	571	2,460	705	3,478	3,546	479	417	48	627	530	99	87	1,248	2,642	2,471	75.9	69.7	837	218	346	508
Georgia	Jan.	321	688	20	802	706	135	109	9	148	126	33	39	318	677	608	84.5	86.1	125	41	107	81
Georgia & Florida	Jan.	332	320	....	324	277	88	78	3	37	31	8	19	84	244	224	75.1	81.0	81	15	42	17
Grand Trunk Western	Jan.	951	4,521	229	5,109	4,707	580	560	54	922	786	94	85	2,622	4,421	3,872	86.5	82.3	688	369	—257	154
Great Northern	Jan.	8,285	17,314	775	19,136	16,685	3,047	2,472	308	4,122	3,541	751	475	7,448	15,999	13,806	83.6	82.7	3,137	1,683	1,087	1,098
Green Bay & Western	Jan.	224	351	....	360	324	62	47	4	47	43	9	24	114	268	239	74.4	73.8	92	43	19	19
Gulf, Mobile & Ohio	Jan.	2,757	6,257	338	7,073	6,523	993	986	72	1,382	1,213	285	284	2,280	5,308	4,842	75.1	74.2	1,765	729	607	688
Illinois Central	Jan.	6,531	19,385	1,892	23,571	22,175	3,568	3,137	405	4,312	3,950	763	609	9,071	18,666	17,027	79.2	76.8	4,905	2,595	1,710	2,015
Illinois Terminal	Jan.	355	874	33	1,035	859	123	101	21	217	136	43	46	411	860	748	83.0	87.1	175	72	59	32
Kansas City Southern	Jan.	891	3,356	114	3,786	3,453	304	308	44	488	415	92	132	1,181	2,242	1,998	59.2	57.9	1,544	671	624	601
Kansas, Oklahoma & Gulf	Jan.	327	433	....	434	346	60	46	7	29	24	11	30	112	252	226	58.0	65.4	183	77	63	33
Lake Superior & Ishpeming	Jan.	149	61	....	66	48	40	46	7	80	64	17	2	51	190	169	289.2	349.8	—124	31	—149	—134
Lehigh & Hudson River	Jan.	96	265	....	265	261	35	34	2	34	30	8	16	98	199	182	75.2	69.7	66	25	9	23
Lehigh & New England	Jan.	178	537	....	542	434	60	67	6	197	152	40	19	206	528	452	97.3	104.2	14	33	100	18
Lehigh Valley	Jan.	1,150	4,913	288	5,505	5,275	643	648	93	972	957	207	153	2,680	4,701	4,427	85.4	83.9	804	448	243	344
Litchfield & Madison	Jan.	44	318	....	323	277	10	12	1	26	26	6	44	62	160	156	49.6	56.2	163	64	48	39
Long Island	Jan.	351	992	3,933	5,123	4,763	733	623	117	1,154	945	155	28	2,765	4,855	4,263	94.8	89.5	268	344	—393	—97

REVENUES AND EXPENSES OF RAILWAYS

(Dollar figures are stated in thousands; i.e., with last three digits omitted)

MONTH OF JANUARY OF CALENDAR YEAR 1956

Name of Road		Average mileage operated during period	Operating Revenues: Freight	Pass.	Total (inc. misc.) 1956	Total (inc. misc.) 1955	Operating Expenses: Maint. Way and Structures: Total 1956	Total 1955	Deprec. and Retirements	Maint. Equipment: Total 1956	Total 1955	Deprec. and Retirements	Traffic	Transportation	Total 1956	Total 1955	Operating ratio 1956	Operating ratio 1955	Net from railway operation	Railway tax accruals	Net railway operating income 1956	Net railway operating income 1955
Louisiana & Arkansas	Jan.	753	2,162	54	2,321	2,252	206	205	20	279	256	92	75	700	1,341	1,214	57.8	53.9	980	405	460	517
Louisville & Nashville	Jan.	4,732	15,490	895	17,621	16,671	2,503	2,151	243	3,473	3,102	833	371	6,668	13,752	12,096	78.0	72.6	3,869	2,671	2,399	2,832
Maine Central	Jan.	944	1,987	76	2,194	2,029	394	395	27	387	333	75	24	870	1,792	1,576	81.7	77.7	402	187	127	185
Minneapolis & St. Louis	Jan.	1,397	1,590	3	1,658	1,675	250	261	25	310	270	77	106	607	1,422	1,322	85.7	79.5	236	147	99	148
Minneapolis, Northfield & Southern	Jan.	105	325	....	358	338	17	16	2	34	24	10	23	71	173	149	48.1	43.9	186	90	84	85
Minn., St. Paul & S. Ste. Marie	Jan.	3,224	2,957	52	3,176	2,713	566	529	41	654	545	125	95	1,364	2,824	2,402	88.9	88.6	352	244	115	134
Missouri-Illinois	Jan.	172	326	....	330	433	59	49	9	77	69	30	11	94	252	256	76.3	59.1	78	51	59	118
Missouri-Kansas-Texas Lines	Jan.	3,241	5,023	230	5,764	5,606	729	775	95	878	856	254	279	2,480	4,692	4,537	81.4	80.9	1,072	447	274	393
Missouri Pacific	Jan.	6,917	15,323	831	17,757	16,699	2,243	2,191	266	3,527	3,498	827	484	6,918	13,854	13,186	78.0	79.0	3,903	1,230	2,154	1,794
International Great Northern	Jan.	1,104	2,544	147	2,924	2,643	511	510	34	537	479	119	63	1,196	2,430	2,235	83.1	84.5	494	149	235	225
Gulf Coast Lines	Jan.	1,723	3,551	66	3,856	3,557	598	616	47	492	488	113	95	1,192	2,529	2,497	65.5	70.2	1,327	165	890	645
Monon*	Jan.	541	1,562	70	1,774	1,728	291	263	21	287	264	73	101	725	1,562	1,378	88.0	79.8	212	106	17	137
Monongahela	Jan.	177	518	....	521	465	59	58	16	55	57	14	....	187	311	282	59.7	60.6	210	Cr. 53	138	39
Nashville, Chatt. & St. Louis	Jan.	1,043	2,500	162	2,986	2,868	470	428	50	424	398	139	126	1,159	2,307	2,198	77.2	76.6	680	319	331	378
New York Central	Jan.	10,710	49,098	8,789	64,982	58,566	5,785	5,677	1,139	10,916	9,634	2,279	1,229	30,698	52,091	46,559	80.2	79.5	12,891	5,698	4,308	5,001
Pittsburgh & Lake Erie	Jan.	221	3,120	72	3,447	2,829	479	398	77	953	702	279	68	1,282	3,019	2,445	87.6	86.4	428	795	836	942
New York, Chicago & St. Louis	Jan.	2,178	13,453	172	13,999	11,632	1,551	1,311	143	2,200	1,993	382	344	5,152	9,717	8,440	69.4	72.6	4,282	1,974	1,699	1,217
New York, New Haven & Hartford	Jan.	1,769	7,205	4,115	12,784	12,144	1,569	1,457	263	2,492	1,650	378	283	6,384	11,715	9,757	91.6	80.3	1,069	955	—1,273	503
New York Connecting	Jan.	21	356	....	374	352	83	79	25	17	21	....	....	92	195	216	51.9	61.5	180	86	99	39
New York, Ontario & Western	Jan.	541	484	....	497	424	94	96	17	94	87	22	24	279	523	498	105.1	117.5	—26	42	—148	—181
New York, Susquehanna & Western	Jan.	120	366	46	429	528	50	53	6	60	60	13	9	208	369	366	86.1	69.3	60	13	4	51
Norfolk & Western	Jan.	2,126	17,588	309	18,807	14,581	2,602	2,192	378	4,293	3,169	705	337	6,156	14,069	10,953	74.8	75.1	4,738	3,156	2,511	1,988
Norfolk Southern	Jan.	604	789	....	804	769	186	162	13	125	113	29	50	263	678	623	84.4	81.0	126	63	36	46
Northern Pacific	Jan.	6,865	12,466	565	14,015	12,840	1,653	1,556	249	3,051	2,642	552	353	6,312	12,272	11,124	87.6	86.6	1,743	1,366	309	573
Northwestern Pacific	Jan.	329	357	....	361	1,088	87	252	18	75	104	4	6	217	409	710	113.4	65.3	—48	62	—286	84
Pennsylvania	Jan.	10,006	59,283	11,438	77,998	69,580	7,938	7,396	1,418	16,510	13,611	2,881	1,396	36,475	66,437	57,641	85.2	82.8	11,561	5,738	2,957	4,543
Pennsylvania-Reading Seashore Lines	Jan.	358	561	85	660	611	189	188	24	119	103	22	9	495	854	772	129.4	126.3	—194	87	—428	—360
Piedmont & Northern	Jan.	128	521	....	533	504	45	44	4	28	28	11	28	86	222	212	41.7	42.0	311	154	105	102
Pittsburgh & West Virginia	Jan.	132	752	....	757	605	105	105	24	136	119	37	69	211	576	498	76.0	82.5	181	85	103	67
Reading	Jan.	1,306	10,144	604	11,448	9,404	1,435	1,035	185	2,125	1,780	425	188	4,643	8,888	7,193	77.6	76.5	2,560	1,105	1,107	1,139
Richmond, Fredericksburg & Potomac	Jan.	118	1,514	573	2,360	2,288	236	310	24	329	314	67	24	799	1,537	1,560	65.1	68.2	823	422	279	226
Rutland	Jan.	391	399	....	432	388	87	92	9	52	47	13	27	161	357	340	82.5	87.6	76	26	21	4
Sacramento Northern	Jan.	267	138	....	145	177	106	71	4	15	17	6	2	73	207	180	142.8	102.0	—62	17	—87	—34
St. Louis-San Francisco	Jan.	4,610	8,539	394	9,626	9,250	1,516	1,373	179	1,679	1,773	532	387	3,891	8,030	7,657	83.4	82.8	1,596	771	785	830
St. Louis, San Francisco & Texas	Jan.	155	339	3	363	389	38	41	4	48	24	1	28	152	280	259	77.1	66.5	83	17	3	43
St. Louis Southwestern Lines	Jan.	1,561	5,410	18	5,594	4,662	680	625	72	632	573	119	188	1,760	3,453	3,051	61.7	65.5	2,141	1,026	920	632
Savannah & Atlanta	Jan.	144	317	....	326	292	48	45	1	41	44	14	19	87	206	191	63.2	65.3	120	43	58	51
Seaboard Air Line	Jan.	4,062	11,817	1,272	14,154	13,513	2,022	2,116	195	2,472	2,322	567	398	4,640	10,124	9,653	71.5	71.4	4,029	1,573	2,141	2,127
Southern	Jan.	6,289	19,866	1,469	22,889	21,581	2,968	2,738	256	4,073	3,631	804	409	7,214	15,707	14,347	68.6	66.5	7,182	3,237	3,496	3,334
Alabama-Great Southern	Jan.	326	1,378	64	1,572	1,318	235	217	32	330	280	60	35	479	1,173	1,057	74.6	80.2	398	170	187	121
Cinn., New Orleans & Texas Pacific	Jan.	337	2,932	181	3,304	3,406	643	489	67	665	645	147	76	891	2,451	2,156	74.2	63.3	853	468	489	532
Georgia Southern & Florida	Jan.	475	711	87	871	866	222	252	10	82	72	10	25	249	632	667	72.6	77.1	239	42	14	—52
New Orleans & Northeastern	Jan.	204	967	44	1,095	778	166	177	21	151	141	43	22	262	666	613	60.9	78.8	428	311	186	52
Southern Pacific	Jan.	8,124	36,315	2,581	41,110	37,666	5,097	4,771	459	8,180	8,091	1,994	937	17,084	33,502	31,260	81.5	83.0	7,608	3,261	3,594	2,899
Texas & New Orleans	Jan.	4,315	10,301	404	11,341	10,313	2,169	1,836	134	1,713	1,437	188	280	4,081	8,859	7,929	78.1	76.9	2,483	753	674	428
Spokane International	Jan.	150	277	....	285	247	55	49	2	29	26	10	6	73	177	157	62.3	63.4	108	41	40	35
Spokane, Portland & Seattle	Jan.	947	2,518	82	2,758	2,485	352	350	60	417	401	114	38	981	1,896	1,695	68.8	68.2	862	292	466	536
Tennessee Central	Jan.	286	457	15	482	386	89	66	8	75	59	20	15	141	348	292	72.3	75.6	134	24	52	26
Texas & Pacific	Jan.	1,831	6,178	307	7,004	6,728	1,124	943	100	1,005	977	251	216	2,429	5,140	4,724	73.4	70.2	1,865	647	746	874
Texas Mexican	Jan.	161	206	....	228	233	48	47	5	27	28	10	11	69	173	167	75.8	71.7	55	24	10	17
Toledo, Peoria & Western	Jan.	239	620	....	626	517	100	63	6	45	56	12	51	151	388	326	62.0	63.1	238	108	76	54
Union Pacific	Jan.	9,805	33,586	2,306	38,529	37,047	5,172	4,967	456	7,893	7,554	1,689	1,180	14,262	30,741	29,357	79.8	79.2	7,788	4,465	1,907	1,817
Virginian	Jan.	611	4,523	1	4,777	3,502	422	401	60	548	710	199	55	940	2,068	1,981	43.3	56.6	2,709	1,482	1,417	815
Wabash	Jan.	2,393	8,325	418	9,478	8,781	1,082	1,026	—7	1,446	1,261	373	340	4,120	7,435	6,785	78.4	77.3	2,043	720	665	797
Ann Arbor	Jan.	294	736	....	741	665	75	68	6	152	134	25	31	360	640	581	86.4	87.3	101	54	20	20
Western Maryland	Jan.	846	4,026	4	4,263	3,382	615	493	45	763	611	221	104	1,388	3,130	2,532	73.4	74.9	1,132	534	782	554
Western Pacific	Jan.	1,193	3,759	176	4,037	3,536	769	617	84	605	611	196	215	1,477	3,348	3,013	82.9	85.2	689	279	378	256
Wisconsin Central	Jan.	1,042	2,333	29	2,487	2,292	317	263	38	387	360	85	83	1,086	1,992	1,780	80.1	77.7	495	165	153	223

*Change in name from Chicago, Indianapolis & Louisville Ry., effective January 11, 1956.

a RAILWAY AGE Workbook Page

Railway Officers

ASSOCIATION OF AMERICAN RAILROADS.—**John H. Heller** has been appointed engineer, Freight Loading & Container Bureau, Freight Loss and Damage Prevention Section, with headquarters at 610 South Main street, Pacific Electric building, Los Angeles, Cal.

ATLANTIC COAST LINE. — R. M. Floyd has been appointed assistant treasurer, **C. J. Cunningham, Jr.**, assistant to treasurer and **A. J. Litgen**, cashier.

H. J. Gerdes has been appointed auditor of disbursements at Wilmington, N. C., succeeding **A. R. Hardwick**, retired. **J. L. Sutton** has been named assistant auditor of disbursements.

BURLINGTON. — H. H. Urbach, assistant vice-president (mechanical) at Chicago, retired March 1.

Robert J. Fiala, city freight agent at Chicago, has been appointed to the newly created position of assistant manager of merchandise traffic there.

CHESAPEAKE & OHIO.—**Maurice F. Anderson** has been appointed general superintendent—signals and communications at Richmond, Va., succeeding **W. N. Hartman**, retired. Mr. Anderson's former position of assistant general superintendent—signals and communications at Detroit has been abolished.

M. E. Ross and **J. H. Phillips**, general coal traffic agents at Detroit

Maurice F. Anderson

and Cincinnati, respectively, have been promoted to assistant coal traffic managers at those points. **C. S. Dennis, J. F. Walser** and **W. F. Pye**, assistant fuel service engineers at Greensboro, N. C.; Huntington, W. Va., and Detroit, respectively, have been promoted to fuel service engineers at the same headquarters.

(Continued on page 88)

Paxton-Mitchell's lower priced **track skate** brings cars to smooth, easy stop in hump yards

It's light — only 17 pounds. **It's tough** — made of cast alloy steel. **It's colorful** — painted chome yellow for easy spotting in weeds or snow. **It works by friction** — when wheels hit skate, friction takes over to slow car. **It's small** — 5⅝" high and 18¼" long. **It's low cost** — it's the lowest cost track skate on the market. **It's approved** — tested and approved by 2 major railroads. **It keeps tracks clear** — eliminates fouling of lead tracks.

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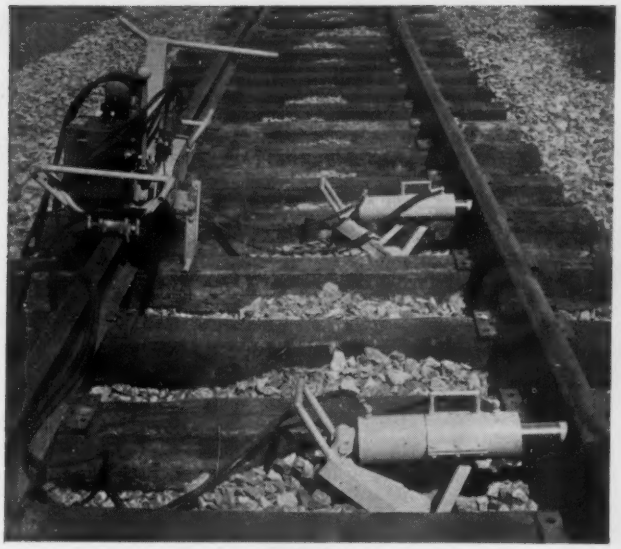

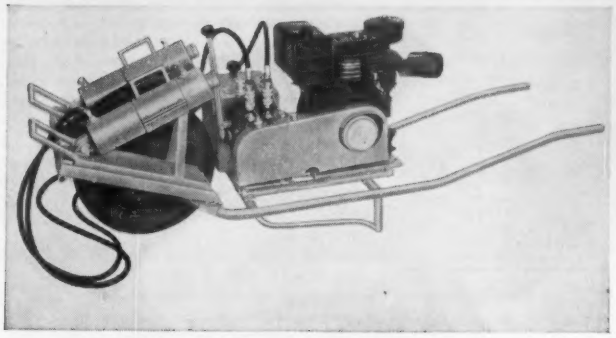

Upper left—Model P-O gasoline engine powered Hydraulic Track Liner operating two hydraulic rams.

Upper right—Model P-O gasoline engine powered Hydraulic Track Liner operating attachment with double flanged track rollers, adjustable for any height and weight of rail.

Lower left—Model P-O gasoline engine powered Hydraulic Track Liner and two hydraulic rams mounted on wheelbarrow type frame that can easily be operated or transported by one man.

Lower right—Model H-O Hydraulic pump, light weight, hand operated, that will supply power for one (as shown) or two rams. Ideal for small gangs.

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Cleveland 6, Ohio

See advertisement on page 43 AA-2699

ELGIN, JOLIET & EASTERN.—E. G. Henderson has been named to the newly created position of director of cost planning.

ILLINOIS TERMINAL.—R. B. White has been appointed assistant chief engineer—signals and communications at St. Louis, and **J. R. McGowan** has become supervisor—signals and communications at Edwardsville, Ill.

LEHIGH & HUDSON RIVER.—Robert I. Huyler, vice-president at Warwick, N. Y., has been elected L&HR president to succeed **Stanley F. Mackay,** who died February 2 at the age of 67.

LOUISVILLE & NASHVILLE.—W. T. Dudley, trainmaster at Latonia, Ky., has been appointed assistant superintendent, Cincinnati division, with the same headquarters, succeeding **J. W. Lovell,** who has been transferred to the Birmingham division at Birmingham, Ala. Mr. Lovell replaces **J. R. Parsons,** transferred to the Cumberland Valley division.

MAINE CENTRAL.—George P. Silva, assistant shop superintendent at Waterville, Me., has been appointed superintendent at that point, succeeding **Frank H. Bennett,** retired. **Elden H. Finnimore,** assistant foreman, succeeds Mr. Silva as assistant shop superintendent.

H. G. Hook has been appointed superintendent of locomotive maintenance. The position of master mechanic at Portland, formerly held by Mr. Hook, has been abolished. **J. D. Rourke,** division general car foreman at Portland, has been appointed superintendent of car maintenance and his former position has been abolished.

Linton D. Millett has been named general agent at Bangor, replacing **J. N. Horton,** who voluntarily requested to be relieved of his duties.

MILWAUKEE. — D. P. Valentine, assistant superintendent of transportation at Seattle, has been advanced to superintendent of transportation, Line West, succeeding **L. V. Anderson,** who has been assigned to operating department duties at Chicago. **G. M. Robson,** trainmaster Milwaukee Terminals, has been transferred to Chicago Terminals, to replace **W. O. Harnish,** resigned. **R. O. Odekirk,** yardmaster at Milwaukee, succeeds Mr. Robson.

NEW YORK CENTRAL.—James B. Gray, assistant general counsel at New York, has been promoted to general counsel, succeeding **Harold H. McLean,** whose appointment as vice-president and general counsel of the **Pittsburgh & Lake Erie** at Pittsburgh was noted in Railway Age Mar. 12, p. 78. **S. H. Hellenbrand,** general tax attorney, has been appointed director of taxes and has been succeeded by **Frank McEvoy,** an attorney.

D. B. Ingold, assistant superintendent, Michigan Central, at Jackson, Mich., has been named superintendent of the west and western divisions at Chicago, succeeding **J. C. Kenefick,** transferred to Toledo, Ohio (Railway Age, Mar. 5, p. 61). **T. E. Reynolds,** trainmaster at Chicago, has been named western division trainmaster. **W. H. Hinderer,** trainmaster, MC, at Hammond, Ind., succeeds Mr. Ingold at Jackson.

NICKEL PLATE.—John H. Hammond, terminal superintendent at Chicago, has been appointed superintendent, Fort Wayne-Chicago divisions at Fort Wayne, Ind., succeeding **C. H. Lee,** who retires March 31. **Glen W. Mathews,** assistant superintendent, Lake Erie & Western district at Muncie, Ind., succeeds Mr. Hammond as terminal superintendent at Chicago.

J. R. Reed has been named general agent in charge of a newly established sales and service office at 610 Broadway Exchange building, Denver Colo.

NORFOLK & WESTERN.—W. A. Noell, superintendent of the Norfolk division at Crewe, Va., will leave for India late this month as a consultant to study that country's railways. The study is being made by Sanderson & Porter, New York engineers and constructors, under contract with the Indian government. A principal aim of the project will be recommendations for increasing the capacity of the government-owned system. During Mr. Noell's three- or four-month absence, **W. S. Clement,** trainmaster of the Pocahontas division at Bluefield, W. Va., will serve as temporary Norfolk division superintendent.

NORFOLK SOUTHERN.—E. Elwood McClure, chairman of the board, has resigned.

PENNSYLVANIA. — Harry L. Decker, assistant mechanical engineer at Philadelphia, has been appointed mechanical engineer there, succeeding **Carleton K. Steins,** retired.

WABASH.—Joseph F. Kolar, perishable traffic agent at Chicago, has been appointed district freight agent there, to succeed the late **James E. Hill.**

OBITUARY

Charles Hewett, 76, retired general auditor of the **Clinchfield,** died February 25 in Chickasha, Okla.

John M. Hall, who retired in 1949 as director of locomotive inspection at the **Interstate Commerce Commission,** died March 8 in Washington, D. C., after a long illness. He was in his 77th year.

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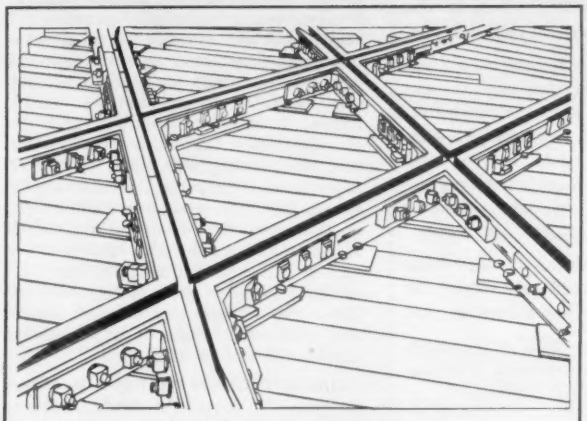

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Flash floods along your right-of-way can plug drainage ditches, loosen ballast, pile silt on tracks, cause a lot of headaches. Gradual erosion which takes place under scattered showers, melting snows, quick thaws and freezes, and high winds during dry seasons, causes the same trouble in a slower, less spectacular way.

Unless this "creeping paralysis" is stopped before it gets a good start, you face the problems of loose ties, spread rails, track dips, broken bank slopes, and eroded shoulders. Repairs then require the services of heavy on-track equipment, full work crews, and temporary slow-up or tie-up of freight and passenger service.

You can prevent these costly consequences with planned, regular maintenance along your right-of-way. You can do it economically, with one man and a modern Adams motor grader. The Adams is an off-track machine which travels fast to the job, works fast when it gets there. It requires no special transport equipment, will not tie-up revenue traffic, disrupt schedules.

Periodic work with grader prevents costly erosion damage. Here a heavy-duty model grades right-of-way for drainage.

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With optional attachments, the work range of your grader can be extended to include many extra duties. *Scarifier* rips out hard-packed dirt, old road beds, roots and stones. *Dozer blade* digs out brush, pushes debris off right-of-way, backfills around culverts, cleans up yards.

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Adams graders are built in five sizes, to meet your requirements. Your inquiry will bring full details.

A size ADAMS for every need

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Model 550 — 123 hp diesel, 23,500 lbs.
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NEW BOOKS

THE LATIN AMERICAN MARKETS. 208 pages. McGraw-Hill Company, Inc. Available from J. Walter Thompson Company, 420 Lexington ave., New York, N.Y., $18.

This book contains some 100,000 facts and figures about markets for a wide range of products in Latin America. It is believed to be the first classification of the internal markets in each country of Latin America to provide an at-a-glance picture of buying potential. It discusses 30 individual countries and/or markets under 10 topics or yardsticks—including transportation and communications. Aims of the new book are: To analyze and describe 30 markets, having about 173,000,000 people; to measure economic progress in Latin American countries, comparing a postwar period with a prewar year whenever possible; an inventory of available marketing data; uniform treatments of the 30 markets for easy comparisons; and to describe ways and means of entering Latin American markets.

WORLD COMMERCE AND GOVERNMENTS; TRENDS AND OUTLOOK, by W. S. Woytinsky and E. S. Woytinsky. 907 pages, tables, maps, charts. Twentieth Century Fund, 330 West 42nd st., New York 36. $10.

From earliest times, trade has been the primary mechanism by which not only goods but ideas and culture have spread around the globe. This comprehensive study examines patterns of trade—and the systems of transportation that feed them and the governments under which they exist—as they now operate throughout the world. Part I gives facts, analysis and description of trade in the world economy; nature, value and volume of exports and imports; tariffs, agreements, payments and investments. Part II examines the whole vast network of transportation by air, land and sea within and between nations. Part III analyzes kinds of governments all over the earth, colonies and colonial status, and the full range of international agencies that now exist.

INDUSTRY-COLLEGE RELATIONS, by Edward Hodnett. 158 pages. The World Publishing Company, 119 W. 57th st., New York 19. $3.50.

A comprehensive and authoritative survey of the ways in which industry and colleges work together, and a practical guide for industry and college leaders who seek to establish better cooperation. Dr. Hodnett, who has had considerable experience in industry-college relations, made a survey for the Conference Committee on Industry-College Relations. After submitting the report on his survey he still had a surplus of information and ideas that it seemed desirable to share with colleges and industry. This book is the result.

ASTM STANDARDS ON PAPER AND PAPER PRODUCTS AND SHIPPING CONTAINERS

(WITH RELATED INFORMATION)—September 1955. 406 pp. American Society for Testing Materials, 1916 Race st., Philadelphia. $3.75.

A revision of a book published in 1953 by ASTM, this compilation includes standard and tentative specifications, test methods and definitions of terms pertaining to paper, paper products and shipping containers. ASTM reports the new volume will be useful to producers and consumers of paper and paper products and shipping containers.

Nineteen standards in the text relate to shipping containers. There is also a 7-page list of term definitions relative to such containers.

BASIC INFORMATION SOURCES. 14 pages. World Trade Information Service, Part 4, No. 55-18. Issued by the Bureau of Foreign Commerce, United States Department of Commerce. Available from the Government Printing Office, Washington 25, D.C. 20¢.

This reference list covering Western Europe, including Greece, is the first of three to be published about foreign railways outside the communist orbit. It is primarily for businessmen, foreign traders, students of transportation, and others who may be interested in inland transport abroad, and the emphasis is not on technical information. Information for each country is broken down into three parts—books and pamphlets, articles in periodicals, and periodicals and serials.

THE GUERNEVILLE BRANCH, by Fred A. Stindt. 40 pages, illustrations. The Western Railroader, P.O. Box 668, San Mateo, Cal. $1.

The former branch railroad down the Russian river that carried so many vacationists to the summer resorts of the area is the subject of this booklet, issued in connection with a recent railroad excursion over the Northwestern Pacific. The booklet gives a complete story of the Guerneville branch from its start in 1876 as the Fulton & Guerneville Railroad to its abandonment by the Northwestern Pacific November 14, 1935. It has 35 photographs, a map, samples of timetables from the beginning to the end, and a roster of all locomotives that operated on the line.

TRADE PUBLICATIONS

GUIDEPOSTS TO WOOD MARKETS. 17 pages. Timber Engineering Company, 1319 18th st., N.W., Washington 6, D.C. Free.

A more complete and exact engineering knowledge of sawn and laminated timbers, that could bring new economies in wood construction, can be obtained by developing use of ultrasonics in stress grading structural timbers, according to this booklet. The use of sound waves to "X-ray" timbers and boards would provide accurate diagnosis of the products throughout, enabling their full working strength to be used. Thus, smaller timbers could be used in many instances where larger ones are presently required;

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D Tournapull can travel 10, 25 or 50 miles...complete one or more average maintenance jobs...and get back to its original assignment, all in one day! Its 28 mph work and travel speeds let you handle emergencies as soon as they are reported. On a typical day, a "D" can complete a schedule like this:

7:45 A.M. Station agent reports washout 30 miles away.

8:00 A.M. Operator reports for work, gets assignment, climbs on Tournapull, and drives off. No waiting for flatbed, no loading or blocking. Rig averages 20 to 28 mph through traffic.

9:30 A.M. Arrives at site.

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10:30 A.M. Using bulldozer blade, the "D" spends a half-hour finish-grading. One piece of equipment and one operator handle entire assignment.

11:00 A.M. Operator drives rig over main highways 20 miles to next assignment — trimming side-slopes to improve drainage.

12:00 Noon Arrives at site, takes hour for lunch.

1:00 P.M. Starts moving dirt to slough a mile away. Self-loads, hauls along right-of-way, dumps 5 loads in an hour. Finishes slopes, spreads fill with dozer blade.

2:00 P.M. Drives 15 miles to help enlarge yard, build sidings.

2:45 P.M. Starts grading . . . works steadily 'til 4:30. In 1¾ hours, self-loaded "D" moves 140 cubic yards of clay over average 1400′ cycles.

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Ever since its first issue, as a separate publication, *Railway Freight Traffic* has shown terrific gains in reader acceptance; it has registered favorably and has been unqualifiedly accepted among shippers of all types of freight, in all branches of industry. A recent readership survey showed overwhelming acceptance not often equalled in business paper publishing.

This outstanding reader interest is generated because *Railway Freight Traffic* is geared editorially to fostering the interchange of ideas between railroads, shippers and suppliers, and help shippers utilize railway freight services to their best advantage. The great need for this interchange of ideas is exemplified by the fact that in 1955 shippers spent nearly $9-billion for railway freight transportation alone.

Through its highly specialized distribution to more than 6,500 key shippers in the United States and Canada, to leading shipper association personnel, and to important top level and traffic men on railways, *Railway Freight Traffic* each month offers its advertisers—railroads and manufacturers alike—an opportunity to direct sales messages to those ke, individuals responsible for routing America's freight and for recommending the use of related products and services. *RFT* provides a logical medium wherein individual railroads advertise their freight services as a basic part of an overall merchandising program concentrated on *ship-by-rail* promotion.

RAILWAY FREIGHT TRAFFIC
A Simmons-Boardman Publication
30 Church Street, New York 7, N. Y.

Chicago Cleveland San Francisco Washington, D. C.
Dallas Portland, Ore. Los Angeles

Timber Engineering's laboratory has been studying use of ultrasonics in non-destructive testing of wood products for several years. Convincing evidence of benefits to be derived has resulted in the Teco laboratory increasing its facilities for research in this field for its clients. Ultrasonics is one of eight specific fields, cited by the booklet as being "ripe for research and development" by wood industries. Other areas include particle board development for construction and product manufacture; new glues and processes for faster, more economical gluing and laminating; new lumber seasoning methods; wood finishes, preservative treatments, and fire retardants.

A CASE HISTORY: XEROGRAPHY AT WORK FOR WESTINGHOUSE ELECTRIC CORPORATION. 4 pages, illustrations. Haloid Company, Dept. WS-1, Rochester 3, N.Y., Attention M. E. Harris.

This brochure illustrates and describes Westinghouse's new method of progressive report writing for the accounting department. It shows how report writing costs have been reduced 50% and duplicating time cut 30% by xerography.

PERIODICALS

PACIFIC RAILWAY JOURNAL. Fall, 1955. Issued quarterly by the Southern California Chapter, Railway & Locomotive Historical Society and the Pacific Railroad Society. Copies available from Donald Duke, Editor, 2304 Melville Drive, San Marino 9, Cal. Single copies, $1.

The journal is a new magazine designed to preserve the railroad lore and history of the Pacific Coast. This issue contains articles on experience with velocipedes, motor cars and rush cars on rails; cinder trail across the Rockies (a photo section of the early Rio Grande); Death Valley Scotty's $5,000 ride; the picturesque, but now defunct station at South Pasadena; and Fresno traction.

ANNUALS

APPLICATION OF ELECTRICITY TO RAILWAYS, 1954. Bibliography of periodical articles appearing in a select list of periodicals, prepared by E. A. Freeman, assistant librarian, Bureau of Railway Economics Library. 43 pages. Association of American Railroads, Transportation Bldg., Washington 6, D. C. Free.

THE ECONOMIC ALMANAC, 1956. A Handbook of Useful Facts about Business, Labor and Government in the United States and Other Areas. 688 pages. Published for the National Industrial Conference Board by Thomas Y. Crowell Company, 432 Fourth Ave., New York 16. $3.95.

BUS FACTS; A Summary of Facts and Figures on the Motor Bus Industry. 24th Edition, 1955. 72 pages. National Association of Motor Bus Operators, 839 17th St., N.W., Washington 6, D. C. Free.

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Freight Operating Statistics of Large Railways—Selected Items

Region, Road and Year		Miles of road operated	Locomotive-Miles: Train-miles	Locomotive-Miles: Principal and helper	Locomotive-Miles: Light	Car-Miles: Loaded (*thousands*)	Car-Miles: Per cent loaded	Ton-miles (*thousands*): Gross excl. locos & tenders	Ton-miles (*thousands*): Net rev. and non-rev.	Road-locos. on line: Serviceable: Unstored	Road-locos. on line: Serviceable: Stored	Road-locos. on line: B.O.	Road-locos. on line: per cent B.O.
New Eng. Region	Boston & Maine	1955	1,562	254,503	260,430	11,789	9,624	66.5	628,180	255,617	65	..	1	1.5
		1954	1,564	248,385	253,556	9,262	8,848	63.3	584,334	230,591	71	1	4	5.3
	N. Y., N. H. & Htfd.	1955	1,746	285,555	285,601	18,590	11,532	67.3	711,579	287,280	99	..	8	7.5
		1954	1,746	265,629	265,651	18,308	10,611	64.4	673,071	265,015	89	..	2	2.2
Great Lakes Region	Delaware & Hudson	1955	792	187,432	193,114	7,365	10,118	70.7	683,161	359,339	40	..	1	2.4
		1954	792	194,228	200,140	10,811	9,144	64.2	644,459	320,454	39	2	3	6.8
	Del., Lack. & Western	1955	962	312,683	328,754	27,558	12,887	67.8	852,584	373,724	62	..	2	3.1
		1954	962	277,502	291,638	22,199	11,932	64.5	802,161	341,644	64	..	..	..
	Erie	1955	2,226	611,983	618,355	26,429	32,879	68.3	2,035,539	818,745	165	..	..	..
		1954	2,224	552,796	559,734	19,883	29,270	65.9	1,822,517	698,381	159	..	5	3.0
	Grand Trunk Western	1955	951	304,212	310,058	2,560	9,409	59.8	685,294	281,098	59	..	18	23.4
		1954	952	247,963	253,776	2,097	8,127	56.9	597,917	231,043	57	6	15	19.2
	Lehigh Valley	1955	1,137	218,106	222,072	8,974	10,742	66.2	737,366	341,422	32	..	2	5.9
		1954	1,142	208,621	211,993	6,351	10,180	62.9	700,654	306,015	32	1	1	2.9
	New York Central	1955	10,661	2,689,962	2,741,068	120,097	106,114	60.0	7,810,515	3,432,886	572	4	73	11.2
		1954	10,663	2,447,777	2,482,047	96,004	95,111	57.2	6,963,827	2,910,875	578	131	99	12.3
	New York, Chic. & St. L.	1955	2,154	780,661	804,532	7,057	31,479	63.4	2,226,184	985,342	175	..	21	10.7
		1954	2,155	713,846	735,108	6,137	26,872	60.4	1,920,973	810,049	140	32	38	18.1
	Pitts. & Lake Erie	1955	221	66,316	66,588	34	2,837	65.8	237,436	142,691	14	..	1	6.7
		1954	221	57,020	57,156	200	2,406	59.5	226,441	130,293	12	7	1	5.0
	Wabash	1955	2,381	549,279	551,678	6,583	24,013	64.9	1,560,687	592,293	104	..	1	1.0
		1954	2,381	526,155	526,676	6,754	22,809	64.7	1,468,354	553,573	103	..	..	..
Central Eastern Region	Baltimore & Ohio	1955	5,920	1,748,005	1,940,842	190,719	64,239	60.3	5,321,377	2,532,972	455	1	86	15.9
		1954	6,078	1,456,749	1,597,208	136,093	55,263	58.7	4,299,290	1,958,887	427	56	108	18.3
	Bessemer & Lake Erie	1955	208	39,892	39,833	48	1,452	65.5	155,523	99,151	13	3	..	..
		1954	209	27,159	27,314	30	1,010	63.2	99,228	58,643	9	6	..	..
	Central RR Co. of New Jersey	1955	613	127,632	128,675	6,330	5,203	68.1	379,907	204,077	64	..	1	1.5
		1954	613	126,149	126,902	5,143	4,901	63.7	364,879	186,237	60	2	5	7.5
	Chicago & Eastern Ill.	1955	868	140,534	140,534	2,823	5,729	63.8	426,159	207,797	28	..	2	6.7
		1954	868	136,011	136,011	2,859	5,417	61.2	366,845	197,344	27	..	2	6.9
	Elgin, Joliet & Eastern	1955	236	91,801	92,505	....	2,798	62.0	230,446	123,452	36	..	4	10.0
		1954	236	74,925	75,096	....	2,314	66.3	189,238	100,795	33	7	3	7.0
	Pennsylvania System	1955	9,892	3,016,004	3,201,538	238,034	122,335	63.0	8,817,868	4,040,675	826	15	414	33.0
		1954	9,890	2,666,090	2,857,949	202,079	109,707	60.9	8,011,776	3,569,123	742	237	408	29.4
	Reading	1955	1,306	376,596	378,749	11,637	14,710	63.4	1,215,537	662,578	165	..	29	14.9
		1954	1,304	332,824	335,954	14,057	11,984	58.8	1,004,709	514,772	152	18	22	11.5
	Western Maryland	1955	846	179,992	188,079	11,805	7,263	62.3	620,391	350,492	35	..	..	..
		1954	847	157,237	161,946	7,943	5,515	58.7	471,444	254,695	35	..	..	..
Pocahontas Region	Chesapeake & Ohio	1955	5,067	1,616,499	1,645,727	54,853	64,071	55.2	5,680,000	3,109,862	454	4	128	21.8
		1954	5,063	1,322,287	1,343,885	40,133	52,093	54.8	4,520,323	2,433,351	343	45	198	33.8
	Norfolk & Western	1955	2,103	783,118	842,905	73,532	37,099	59.1	3,424,153	1,890,944	232	5	18	7.1
		1954	2,110	644,502	689,446	55,301	29,479	56.9	2,753,653	1,475,088	224	29	20	7.3
Southern Region	Atlantic Coast Line	1955	5,278	894,219	894,231	10,892	27,445	55.9	2,085,383	924,426	235	..	1	.4
		1954	5,334	819,987	819,900	8,822	24,103	52.9	1,859,300	782,546	239	..	3	1.2
	Central of Georgia	1955	1,731	200,242	200,265	1,835	8,111	68.2	561,530	271,891	75	..	2	2.6
		1954	1,731	187,083	187,107	2,084	7,272	66.0	501,947	233,919	72	..	2	2.7
	Gulf, Mobile & Ohio	1955	2,717	278,787	278,787	153	15,409	66.8	1,059,230	499,814	88	..	3	3.3
		1954	2,718	282,843	282,843	582	15,308	66.2	1,058,563	490,346	86	..	3	3.4
	Illinois Central	1955	6,531	1,348,130	1,350,129	41,517	51,794	60.5	3,891,485	1,797,157	413	5	147	26.0
		1954	6,539	1,260,892	1,262,922	40,891	47,023	60.5	3,436,163	1,530,103	426	88	147	22.2
	Louisville & Nashville	1955	4,714	996,767	1,005,538	20,722	35,507	61.5	2,708,222	1,376,815	191	..	21	9.9
		1954	4,716	903,645	909,404	17,126	31,812	59.1	2,446,875	1,200,103	242	41	11	3.7
	Nash., Chatt. & St. Louis	1955	1,043	185,959	190,682	4,268	5,793	67.5	3,891,485	182,309	50	..	3	5.7
		1954	1,043	182,982	187,513	4,518	6,084	70.4	3,436,163	168,913	50	..	3	5.7
	Seaboard Air Line	1955	4,053	674,726	674,726	3,148	26,220	61.6	1,932,204	880,563	147	..	7	4.5
		1954	4,053	626,191	626,191	1,635	24,638	59.5	1,829,255	804,343	141	..	6	4.1
	Southern	1955	6,259	948,498	948,568	12,922	45,270	66.2	2,989,414	1,360,420	278	..	2	.7
		1954	6,264	945,064	945,124	13,226	40,321	62.8	2,690,751	1,159,985	273	..	1	.4
Northwestern Region	Chicago & North Western	1955	7,810	731,187	733,924	9,529	29,717	65.0	2,002,180	891,510	134	14	39	20.9
		1954	7,848	704,976	705,342	9,629	28,629	64.7	1,933,238	873,185	147	38	42	18.5
	Chicago Great Western	1955	1,437	137,839	137,839	187	8,005	69.9	528,098	242,815	30	..	3	9.1
		1954	1,437	136,724	136,724	239	7,523	65.4	509,109	221,497	31	..	2	6.1
	Chic., Milw., St. P. & Pac.	1955	10,633	997,279	1,013,227	22,531	41,541	64.4	2,847,208	1,259,547	271	7	12	4.1
		1954	10,633	1,003,337	1,016,143	20,218	40,801	59.9	2,861,269	1,210,846	252	54	24	7.3
	Chic., St. P., Minn. & Omaha	1955	1,606	166,307	167,659	5,259	5,490	63.9	391,816	171,970	59	..	18	23.5
		1954	1,606	166,095	167,689	5,161	5,553	67.5	381,519	169,503	61	1	19	23.2
	Duluth, Missabe & Iron Range	1955	570	34,847	35,171	554	662	53.6	51,977	24,988	28	23	21	29.2
		1954	569	29,760	29,760	100	536	54.1	43,976	21,321	24	29	12	18.5
	Great Northern	1955	8,273	1,171,482	1,179,270	44,485	41,323	68.6	2,898,330	1,377,080	276	55	41	11.0
		1954	8,288	1,025,749	1,032,647	30,328	38,678	66.2	2,704,533	1,234,229	227	172	32	7.4
	Minneap., St. P. & S. Ste. M.	1955	4,171	398,211	400,603	2,667	9,835	64.6	906,829	299,255	79	11	3	3.2
		1954	4,171	384,469	387,301	4,780	12,197	64.9	800,661	360,450	96	..	20	17.2
	Northern Pacific	1955	6,569	884,370	906,397	25,950	33,258	63.9	2,309,595	1,037,286	264	38	57	15.9
		1954	6,570	838,649	857,695	22,711	31,446	61.8	2,233,172	959,786	287	25	55	15.0
Central Western Region	Atch., Top. & S. Fe (incl. G. C. & S. F. and P. & S. F.)	1955	13,147	2,620,335	2,732,359	70,553	118,985	63.0	8,091,475	2,927,394	529	89	23	3.6
		1954	13,076	2,351,585	2,438,339	55,510	104,243	62.5	7,108,231	2,543,595	521	91	32	5.0
	Chic., Burl. & Quincy	1955	8,772	1,138,766	1,131,762	28,383	48,622	64.7	3,294,153	1,408,906	260	23	36	11.3
		1954	8,824	1,200,230	1,199,344	33,421	46,879	62.6	3,173,941	1,334,856	275	25	38	11.2
	Chic., Rock I. & Pac.	1955	7,903	897,199	894,717	1,016	35,565	62.2	2,542,717	1,049,264	171	..	4	2.3
		1954	7,907	871,821	867,131	1,057	34,296	61.4	2,441,523	989,699	165	1	9	5.1
	Denver & R. G. Wn.	1955	2,155	303,524	326,604	38,300	14,218	68.6	996,760	478,217	63	9	29	28.7
		1954	2,165	292,419	311,100	27,309	13,199	68.8	932,081	449,252	62	42	33	24.1
	Southern Pacific	1955	8,066	2,199,486	2,284,478	170,290	93,441	65.2	6,250,211	2,534,865	606	41	105	14.0
		1954	8,063	2,117,758	2,220,590	257,868	93,246	66.1	6,231,374	2,579,022	594	50	112	14.8
	Union Pacific	1955	9,805	2,484,707	2,535,615	107,756	107,516	63.1	7,331,857	3,029,134	457	47	140	21.7
		1954	9,813	2,320,209	2,366,622	103,497	100,870	66.3	6,726,519	2,842,406	432	243	114	14.4
	Western Pacific	1955	1,190	214,659	224,658	13,794	9,285	68.6	613,567	671,833	45	1	..	..
		1954	1,190	213,675	222,221	9,947	9,579	69.4	637,072	295,273	40	3	..	..
Southwestern Region	International-Gt. Northern*	1955	1,104	138,852	138,852	151	5,894	64.3	421,432	191,930	40	..	2	4.8
		1954	1,103	134,329	134,329	....	5,392	64.1	393,511	175,573	43	..	1	2.3
	Kansas City Southern	1955	886	162,326	162,571	454	8,796	65.4	645,735	291,690	26	..	2	7.1
		1954	886	136,536	136,543	111	7,566	65.2	540,768	237,479	22	..	2	8.3
	Mo.-Kans.-Texas Lines	1955	3,230	336,645	336,645	3,383	14,486	64.7	955,130	408,999	85	..	..	..
		1954	3,229	370,495	370,495	4,037	14,055	62.6	917,922	378,208	84	..	..	..
	Missouri Pacific*	1955	6,899	1,012,672	1,012,672	10,587	44,490	64.1	3,095,854	1,354,397	217	25	38	13.6
		1954	6,896	971,701	971,776	11,309	42,322	63.8	2,928,580	1,270,029	191	47	87	26.8
	Texas & Pacific	1955	1,822	350,038	350,038	4,077	16,244	60.7	1,202,279	451,654	62	..	1	1.6
		1954	1,822	352,887	352,887	3,552	15,559	60.9	1,135,256	409,836	62	..	1	1.6
	St. Louis-San Francisco	1955	4,573	619,242	619,242	5,847	24,921	65.6	1,663,826	734,363	112	..	7	5.9
		1954	4,564	610,832	610,832	5,781	24,028	63.5	1,625,196	694,974	113	..	3	2.6
	St. Louis Southw. Lines	1955	1,554	341,032	341,122	1,695	16,067	71.2	1,004,728	449,128	55	..	2	3.5
		1954	1,554	293,538	293,538	1,410	13,533	65.6	868,336	388,158	51	5	11	16.4
	Texas & New Orleans	1955	4,302	715,889	715,889	1,948	28,688	65.6	1,980,134	872,283	142	..	2	1.4
		1954	4,275	691,923	691,923	12,104	27,398	62.5	1,921,220	809,669	136	..	30	18.1

For the Month of December 1955 Compared with December 1954

Region, Road and Year		Freight cars on line: Home	Foreign	Total	Per Cent B.O.	G.t.m.per train-hr. excl.locos and tenders	G.t.m.per train-mi. excl.locos and tenders	Net ton-mi. per train-mile	Net ton-mi. per l'd car-mile	Net ton-mi. per car-day	Car-miles per car-day	Net daily ton-mi. per road-mi.	Train-miles per train-hour	Miles per loco. per day
New Eng. Region	Boston & Maine 1955	1,694	9,265	10,959	4.3	37,968	2,475	1,007	26.6	759	43.0	5,279	15.4	152.2
	1954	2,864	7,200	10,064	5.5	37,352	2,358	930	26.1	722	43.8	4,756	15.9	123.8
	N. Y., N. H. & Htfd. 1955	2,038	17,899	19,937	2.6	39,366	2,492	1,006	24.9	455	27.1	5,308	15.8	114.6
	1954	3,410	11,875	15,285	4.1	40,822	2,534	998	25.0	527	32.8	4,896	16.1	124.0
Great Lakes Region	Delaware & Hudson 1955	2,284	5,516	7,740	4.8	64,534	3,660	1,925	35.5	1,483	59.1	14,636	17.7	172.0
	1954	7,219	3,974	11,193	5.8	62,423	3,333	1,657	35.0	956	42.5	13,052	18.8	162.3
	Del., Lack. & Western 1955	4,298	12,955	17,253	2.2	47,086	2,767	1,213	29.0	717	36.5	12,532	17.3	196.8
	1954	8,133	10,036	18,169	3.0	51,729	2,936	1,251	28.6	634	34.3	11,456	17.9	174.6
	Erie 1955	7,423	20,126	27,549	3.3	63,490	3,359	1,351	24.9	979	57.5	11,865	19.1	139.1
	1954	11,751	15,723	27,474	5.1	63,959	3,326	1,275	23.9	807	51.4	10,130	19.4	127.8
	Grand Trunk Western 1955	4,102	10,490	14,592	6.9	49,048	2,276	933	29.9	636	35.6	9,535	21.8	145.6
	1954	4,745	8,254	12,999	5.7	51,625	2,429	938	28.4	569	35.2	7,829	21.4	112.3
	Lehigh Valley 1955	7,715	8,713	16,428	4.8	70,962	3,418	1,582	31.8	667	31.7	9,687	21.0	238.1
	1954	10,014	6,523	16,537	3.9	69,003	3,381	1,477	30.1	599	31.7	8,644	20.5	220.9
	New York Central 1955	49,696	104,341	154,037	3.3	48,774	2,947	1,295	32.4	725	37.4	10,387	16.8	157.6
	1954	72,050	78,411	150,461	8.3	49,934	2,891	1,208	30.6	611	34.9	8,806	17.6	116.0
	New York, Chic. & St. L. 1955	7,156	18,089	25,245	6.1	48,548	2,926	1,295	31.3	1,254	63.2	14,756	17.0	147.5
	1954	11,114	13,047	24,161	8.5	50,290	2,733	1,152	30.1	1,100	60.4	12,126	18.7	121.7
	Pitts. & Lake Erie 1955	2,318	8,225	10,543	2.9	54,596	3,632	2,182	50.3	406	12.3	20,828	15.2	156.0
	1954	8,651	5,203	13,854	11.6	60,000	3,992	2,297	54.2	303	9.4	19,018	15.1	89.3
	Wabash 1955	9,065	10,363	19,428	4.2	61,401	2,853	1,083	24.7	984	61.5	8,025	21.6	181.6
	1954	8,808	10,015	18,823	7.7	63,017	2,805	1,057	24.3	938	59.7	7,500	22.6	176.1
Central Eastern Region	Baltimore & Ohio 1955	42,267	49,181	91,448	6.4	47,048	3,097	1,474	39.4	898	37.8	13,802	15.5	133.3
	1954	59,310	34,204	93,514	14.5	47,122	2,985	1,360	35.4	674	32.4	10,396	16.0	101.9
	Bessemer & Lake Erie 1955	3,133	967	4,100	17.4	60,989	4,082	2,602	68.3	815	18.2	15,377	15.6	94.0
	1954	6,756	661	7,417	19.3	47,821	3,962	2,342	58.1	247	6.7	9,051	13.1	72.6
	Central RR Co. of New Jersey 1955	2,419	9,955	12,374	7.6	43,582	3,103	1,667	39.2	528	19.8	10,739	14.6	88.6
	1954	5,671	9,356	15,027	11.7	41,332	3,016	1,539	38.0	401	16.5	9,800	14.3	89.0
	Chicago & Eastern Ill. 1955	2,511	3,645	6,156	9.3	51,895	3,050	1,487	36.3	1,083	46.8	7,722	17.1	161.8
	1954	2,882	3,336	6,218	4.0	46,034	2,710	1,458	36.4	986	44.2	7,334	17.1	165.4
	Elgin, Joliet & Eastern 1955	6,853	9,989	16,842	5.2	20,197	2,669	1,430	44.1	237	8.7	16,874	8.0	96.1
	1954	8,014	6,352	16,366	8.3	22,783	2,631	1,401	43.6	225	7.8	13,777	9.0	75.2
	Pennsylvania System 1955	95,046	99,274	194,320	7.7	50,664	3,007	1,378	33.0	670	32.2	13,177	17.3	94.6
	1954	112,189	91,985	204,174	14.5	52,982	3,089	1,376	32.5	565	28.5	11,641	17.6	77.6
	Reading 1955	11,059	22,146	33,205	3.9	50,612	3,228	1,759	45.0	652	22.8	16,366	15.7	75.7
	1954	21,374	15,585	36,959	5.4	45,351	3,020	1,547	43.0	451	17.8	12,734	15.0	68.6
	Western Maryland 1955	4,127	5,831	9,958	2.5	48,888	3,529	1,994	48.3	1,156	38.4	13,364	14.2	195.7
	1954	8,303	3,415	11,718	2.7	43,802	3,066	1,656	46.2	772	28.5	9,700	14.6	143.5
Pocahontas Region	Chesapeake & Ohio 1955	45,622	30,700	76,322	1.4	64,646	3,441	1,939	48.5	1,272	47.4	19,798	18.4	102.1
	1954	59,837	23,398	83,235	4.2	64,878	3,434	1,849	46.7	942	36.8	15,504	19.0	83.5
	Norfolk & Western 1955	32,290	10,665	42,955	1.3	71,873	4,523	2,498	51.0	1,443	47.9	29,005	16.4	123.9
	1954	40,250	5,742	45,992	1.5	73,525	4,396	2,355	50.0	1,042	36.6	22,551	17.2	95.7
Southern Region	Atlantic Coast Line 1955	18,331	17,856	36,187	4.1	42,725	2,345	1,039	33.7	829	44.1	5,650	18.3	136.5
	1954	22,956	14,686	37,642	2.6	40,279	2,277	958	32.5	698	40.6	4,733	17.8	121.9
	Central of Georgia 1955	2,463	6,600	9,063	3.7	48,748	2,809	1,360	33.5	965	42.2	5,067	17.4	92.9
	1954	3,797	4,620	8,417	5.1	48,278	2,692	1,255	32.2	879	41.4	4,359	18.0	91.9
	Gulf, Mobile & Ohio 1955	5,327	11,437	16,764	2.7	73,675	3,803	1,795	32.4	966	44.6	5,934	19.4	106.9
	1954	6,759	7,952	14,711	3.0	77,087	3,747	1,736	32.0	1,074	50.6	5,820	20.6	110.1
	Illinois Central 1955	24,508	28,313	52,821	1.7	47,238	2,939	1,358	34.7	1,093	52.1	8,877	16.4	85.6
	1954	32,028	18,048	50,076	2.1	46,945	2,757	1,228	32.5	967	49.1	7,548	17.2	68.4
	Louisville & Nashville 1955	26,620	15,254	41,874	2.9	47,173	2,723	1,384	38.8	1,067	44.8	9,422	17.4	166.4
	1954	39,518	10,735	50,253	3.4	48,024	2,715	1,331	37.7	777	34.8	8,209	17.7	110.1
	Nash., Chatt. & St. Louis 1955	3,360	2,979	6,339	4.9	41,740	2,109	982	31.5	922	43.4	5,638	19.8	131.1
	1954	4,045	2,935	6,980	3.1	42,645	2,083	926	27.8	779	39.9	5,224	20.5	124.9
	Seaboard Air Line 1955	12,666	16,082	28,748	2.5	53,182	2,926	1,333	33.6	1,006	48.6	7,008	18.6	168.2
	1954	15,996	12,929	28,925	2.2	53,844	2,966	1,304	32.6	928	47.8	6,402	18.4	161.5
	Southern 1955	14,368	26,905	41,273	3.0	53,701	3,167	1,441	30.1	1,058	53.2	7,011	17.0	119.7
	1954	18,433	24,924	43,357	5.2	49,411	2,860	1,233	28.8	846	46.8	5,974	17.4	121.5
Northwestern Region	Chicago & North Western 1955	15,111	27,244	42,355	5.0	50,890	2,776	1,236	30.0	652	33.4	3,682	18.6	135.9
	1954	19,449	22,820	42,269	4.4	49,869	2,815	1,271	30.5	648	32.8	3,589	18.2	110.9
	Chicago Great Western 1955	1,626	4,113	5,739	3.2	73,592	3,837	1,764	30.3	1,390	65.5	5,451	19.2	140.8
	1954	2,659	3,552	6,211	3.1	72,461	3,727	1,622	29.4	1,151	59.8	4,972	19.5	139.3
	Chic., Milw., St. P. & Pac. 1955	28,700	32,813	61,513	5.6	56,591	2,864	1,267	30.3	661	33.9	3,821	19.8	113.7
	1954	37,945	26,443	64,388	5.8	54,189	2,863	1,211	29.7	611	34.4	3,673	19.0	100.1
	Chic., St. P., Minn. & Omaha 1955	1,178	7,698	8,876	3.0	34,561	2,406	1,056	31.3	613	30.6	3,454	14.7	84.8
	1954	1,152	6,521	7,673	4.4	33,344	2,331	1,035	30.5	691	33.6	3,405	14.5	76.2
	Duluth, Missabe & Iron Range 1955	13,890	930	14,820	2.0	22,757	1,602	770	37.7	54	2.7	1,414	15.3	19.9
	1954	14,651	643	15,194	1.9	22,892	1,571	762	39.8	45	2.1	1,209	15.5	17.4
	Great Northern 1955	21,328	22,280	43,608	2.5	47,741	2,512	1,193	33.3	987	43.2	5,370	19.3	114.1
	1954	23,991	17,822	41,813	2.7	51,685	2,657	1,212	31.9	910	43.1	4,804	19.6	82.7
	Minneap., St. P. & S. Ste. M. 1955	6,294	8,778	15,072	4.5	47,510	2,296	758	30.4	646	32.9	2,314	20.9	155.3
	1954	7,762	7,677	15,439	5.2	44,187	2,100	945	29.6	771	40.2	2,788	21.2	119.3
	Northern Pacific 1955	18,242	19,669	37,911	5.2	48,509	2,625	1,179	31.2	926	46.5	5,094	18.6	91.1
	1954	20,923	15,396	36,319	5.2	50,945	2,678	1,151	30.5	861	45.7	4,712	19.1	83.5
Central Western Region	Atch. Top. & S. Fe (incl. G. C. & S. F. and P. & S. F.). 1955	52,000	34,883	86,883	3.0	73,570	3,100	1,122	24.6	1,082	69.7	7,183	23.8	148.3
	1954	58,600	31,908	90,508	3.5	71,683	3,034	1,086	24.4	905	59.4	6,275	23.7	132.2
	Chic., Burl. & Quincy 1955	20,217	24,276	44,493	3.2	60,529	2,898	1,240	29.0	1,023	54.6	5,181	20.9	131.2
	1954	23,184	22,130	45,314	2.5	56,039	2,650	1,114	28.5	946	53.1	4,880	21.2	124.7
	Chic., Rock I. & Pac. 1955	11,458	21,049	32,507	4.9	58,065	2,841	1,172	29.5	1,037	56.6	4,283	20.5	172.7
	1954	15,208	16,684	31,892	4.6	56,142	2,804	1,137	28.9	1,008	56.9	4,038	20.0	168.4
	Denver & R. G. Wn. 1955	7,635	6,802	14,437	2.7	60,013	3,293	1,580	33.6	1,011	43.8	7,158	18.3	123.2
	1954	8,225	5,853	14,078	3.3	60,849	3,197	1,541	34.0	1,022	43.6	6,694	19.1	84.0
	Southern Pacific 1955	31,512	49,605	81,117	1.4	54,973	2,873	1,165	27.1	988	55.9	10,138	19.3	112.9
	1954	34,048	36,513	70,561	1.6	56,288	2,978	1,232	27.7	1,147	62.7	10,318	19.1	112.1
	Union Pacific 1955	27,693	37,751	65,444	1.7	74,375	2,983	1,232	28.2	1,495	84.1	9,966	25.2	134.6
	1954	32,995	30,134	63,129	2.6	75,441	2,927	1,237	28.2	1,445	77.4	9,344	26.0	103.4
	Western Pacific 1955	2,277	5,551	7,828	1.3	69,526	2,893	1,282	29.3	1,165	58.0	7,369	24.3	173.4
	1954	2,682	2,864	5,546	2.4	75,716	3,002	1,391	30.8	1,692	79.2	8,004	25.4	173.8
Southwestern Region	International-Gt. Northern* 1955	986	6,242	7,228	2.3	65,613	3,041	1,385	32.6	828	39.6	5,608	21.6	111.9
	1954	929	5,135	6,064	3.8	61,727	2,939	1,311	32.6	901	43.2	5,135	21.1	104.0
	Kansas City Southern 1955	963	6,448	7,411	1.4	83,753	3,997	1,806	33.2	1,306	60.2	10,620	21.1	214.2
	1954	1,383	5,373	6,756	5.4	83,684	3,970	1,743	31.4	1,093	53.4	8,646	21.1	189.4
	Mo.-Kans.-Texas Lines 1955	3,792	6,491	10,283	5.3	59,928	2,842	1,217	28.2	1,258	68.9	4,085	21.1	137.7
	1954	5,926	5,753	11,679	6.8	54,399	2,487	1,025	26.9	1,057	62.8	3,778	22.0	153.5
	Missouri Pacific* 1955	15,750	18,370	34,120	1.7	71,082	3,081	1,348	30.4	1,262	64.7	6,333	23.3	120.3
	1954	22,353	16,302	38,655	2.3	67,755	3,022	1,310	30.0	1,060	55.4	5,941	22.5	101.7
	Texas & Pacific 1955	2,808	6,980	9,788	1.5	73,185	3,448	1,295	27.8	1,464	86.8	7,996	21.3	196.7
	1954	3,600	6,172	9,772	2.8	71,906	3,234	1,168	26.3	1,361	84.8	7,256	22.4	195.6
	St. Louis-San Francisco 1955	11,858	11,103	22,961	3.2	55,407	2,692	1,188	29.5	1,058	54.7	5,180	20.6	182.2
	1954	15,079	10,066	25,145	1.9	52,165	2,663	1,139	28.9	937	51.1	4,912	19.6	186.6
	St. Louis Southw. Lines 1955	2,141	4,395	6,536	1.2	63,546	2,959	1,323	28.0	2,177	109.4	9,323	21.6	193.3
	1954	2,762	4,172	6,934	1.7	62,104	2,966	1,326	28.7	1,882	100.0	8,057	21.0	146.0
	Texas & New Orleans 1955	5,567	15,322	20,889	1.5	58,149	2,784	1,226	30.4	1,335	66.9	6,541	21.0	173.6
	1954	7,603	17,625	25,228	1.7	56,859	2,795	1,178	29.6	1,119	60.6	6,110	20.5	142.1

* Report of trustee or trustees

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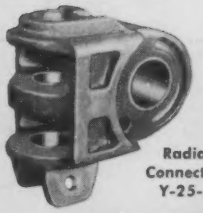

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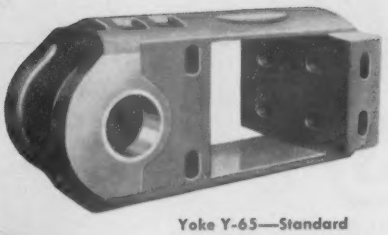

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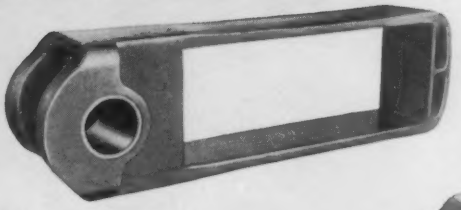

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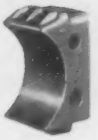

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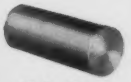

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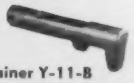

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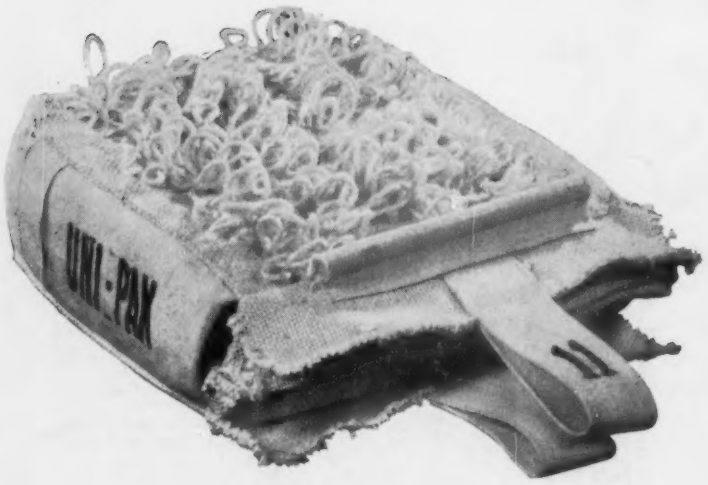

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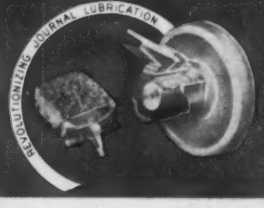

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